



**PROTECTION OF POTABLE WATER SUPPLIES  
IN TENNESSEE WATERSHEDS**

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*2017 Report*

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## TABLE OF CONTENTS

|   |   |           |
|---|---|-----------|
| <b>1.0</b>  | <b>INITIALS AND ACRONYMS</b>  | <b>1</b>  |
| <b>2.0</b>  | <b>INTRODUCTION</b>   | <b>3</b>  |
| <b>3.0</b>  | <b>TENNESSEE WATERSHEDS</b>   | <b>12</b> |
| <b>3.1</b>  | <b>Definition</b>   | <b>12</b> |
| <b>3.2</b>  | <b>The Watershed Approach</b>   | <b>13</b> |
| <b>3.3</b>  | <b>Watershed Planning</b>   | <b>13</b> |
| <b>4.0</b>  | <b>POINT AND NONPOINT SOURCE POLLUTION CHALLENGES TO WATERSHED PROTECTION</b> | <b>16</b> |
| <b>4.1</b>  | <b>Point Sources of Pollution</b>   | <b>16</b> |
| 4.1.A   | Issue of Concern  | 17        |
| 4.1.B   | Restoration Programs and Tools  | 22        |
| <b>4.2</b>  | <b>Nonpoint Sources of Pollution</b>  | <b>24</b> |
| <b>5.0</b>  | <b>DRINKING WATER</b>   | <b>26</b> |
| <b>5.1</b>  | <b>Drinking Water Supply</b>  | <b>26</b> |
| <b>5.2</b>  | <b>Threats to Water Sources</b>   | <b>27</b> |
| 5.2.A   | Drought Impact  | 28        |
| 5.2.B   | Emerging Problems   | 28        |
| <b>5.3</b>  | <b>Other Issues</b>   | <b>30</b> |
| 5.3.A   | Karst   | 30        |
| 5.3.B   | Mercury in Bridges  | 32        |
| <b>6.0</b>  | <b>WATER QUALITY</b>  | <b>33</b> |
| <b>6.1</b>  | <b>Surface Waters</b>   | <b>33</b> |
| <b>6.2</b>  | <b>Ground Water</b>   | <b>38</b> |
| <b>6.3</b>  | <b>Source Water Assessment</b>  | <b>38</b> |
| <b>7.0</b>  | <b>CITIZEN INVOLVEMENT</b>  | <b>39</b> |
| <b>8.0</b>  | <b>RECOMMENDATIONS</b>  | <b>41</b> |
| <b>APPENDIX A – WATER SYSTEMS &amp; THEIR SOURCES</b> |   | <b>1</b>  |
| <b>APPENDIX B – WATER SYSTEMS &amp; THEIR THREATS</b> |   | <b>1</b>  |
| <b>APPENDIX C – SOURCE WATER PROTECTION AREAS</b>     |   | <b>1</b>  |

## 1.0 INITIALS AND ACRONYMS

|              |  |
|--------------|--|
| <b>ARCF</b>  | Agricultural Resources Conservation Fund               |
| <b>BMP</b>   | Best Management Practice                               |
| <b>CAFO</b>  | Concentrated Animal Feeding Operation                  |
| <b>CPCRI</b> | Clinch-Powell Clean Rivers Initiative                  |
| <b>CTA</b>   | Conservation Technology Assistance                     |
| <b>CWSRF</b> | Clean Water State Revolving Fund                       |
| <b>DOI</b>   | Department of Interior                                 |
| <b>DWSRF</b> | Drinking Water State Revolving Fund                    |
| <b>EIS</b>   | Environmental Impact Statement                         |
| <b>EPA</b>   | Environmental Protection Agency                        |
| <b>ERIC</b>  | Eastern Region Initiative on the Clinch                |
| <b>ETSU</b>  | East Tennessee State University                        |
| <b>FSA</b>   | Farm Services Agency                                   |
| <b>GIS</b>   | Geographic Information System                          |
| <b>HAB</b>   | Hazardous Algal Bloom                                  |
| <b>HDSS</b>  | High Definition Stream Survey                          |
| <b>HUC</b>   | Hydrologic Unit Code                                   |
| <b>LID</b>   | Low Impact Development                                 |
| <b>LUM</b>   | Lands Unsuitable for Mining                            |
| <b>MS4</b>   | Municipal Separate Storm Sewer System                  |
| <b>NPDES</b> | National Pollutant Discharge Elimination System        |
| <b>NPS</b>   | NonPoint Source  |
| <b>NRCS</b>  | Natural Resources Conservation Service                 |
| <b>OSMRE</b> | Office of Surface Mining, Reclamation, and Enforcement |
| <b>PED</b>   | Petition Evaluation Document                           |
| <b>QLP</b>   | Qualifying Local Program                               |
| <b>RRAT</b>  | Runoff Reduction Assessment Tool                       |
| <b>SDWA</b>  | Safe Drinking Water Act                                |
| <b>SOC</b>   | Synthetic Organic Compound                             |
| <b>SRF</b>   | State Revolving Fund                                   |
| <b>SWAP</b>  | Source Water Assessment Plan                           |
| <b>TDA</b>   | Tennessee Department of Agriculture                    |

## Initials & Acronyms (continued)

|              |  |
|--------------|--|
| <b>TDEC</b>  | Tennessee Department of Environment and Conservation |
| <b>TMDL</b>  | Total Maximum Daily Load                             |
| <b>TNC</b>   | The Nature Conservancy                               |
| <b>TOC</b>   | Total Organic Carbon.                                |
| <b>TSMP</b>  | Tennessee Stream Mitigation Program.                 |
| <b>TVA</b>   | Tennessee Valley Authority.                          |
| <b>TWRA</b>  | Tennessee Wildlife Resources Agency.                 |
| <b>UD</b>    | Utility District.                                    |
| <b>USGS</b>  | United States Geological Survey.                     |
| <b>USFWS</b> | United States Fish and Wildlife Service.             |
| <b>UT</b>    | University of Tennessee.                             |
| <b>WRTAC</b> | Water Resources Technical Advisory Committee.        |
| <b>WTRBA</b> | West Tennessee River Basin Authority.                |

## 2.0 INTRODUCTION

The Tennessee Department of Environment and Conservation (TDEC) prepared this report to fulfill the requirements of Tennessee Water Quality Control Act, T.C.A. 69-3-107(24) as amended in 2006:

*69-3-107. Duties and authority of the commissioner.*

*In addition to any power, duty, or responsibility given to the commissioner under this part, the commissioner has the power, duty, and responsibility to:*

*(24) "Perform a thorough and ongoing study of, and prepare recommendations regarding options for, the protection of watersheds and the control of sources of pollution in order to assure the future quality of potable drinking water supplies throughout the state. The department is authorized to use information and studies from state, federal and local governments and other sources of reliable scientific data. Initial findings and recommendations shall be presented to the governor and the general assembly no later than February 1, 2007, and annually thereafter."*

This report presents a summary of some of the activities within the Division of Water Resources that TDEC uses in protecting water quality. As this report illustrates, TDEC: 1) has posted Watershed Water Quality Management Plans (watershed inventory reports) on the TDEC website, 2) reports on the status of water quality biennially, and 3) updates its water quality standards triennially. The documents associated with these three activities describe the condition of Tennessee's 55 watersheds and establish the criteria used to assess water quality in the state. In addition, TDEC requires public water systems to update source water protection/wellhead protection plans annually and submit updated reports/plans triennially.

This report is a summary of these documents as well as TDEC's ongoing programs to protect watersheds and control sources of pollution and—through a series of maps—illustrates the threats to drinking water supplies. Finally, as required by the 2006 amendment, several recommendations are presented for further protection of potable water supplies. A more thorough description of the items contained in the report is found on the department's web site.

Division of Water Resources Page:

<http://tn.gov/environment/section/wr-water-resources>

Division of Water Resources, Watershed Stewardship Page:

<http://tn.gov/environment/topic/wr-ws-watershed-stewardship>

Division of Water Resources, Watershed Management Approach Page:

<http://tn.gov/environment/article/wr-ws-watershed-management-approach>

Division of Water Resources, Water Quality Page:

<http://tn.gov/environment/topic/wr-wq-water-quality>

Division of Water Resources, Drinking Water Program Page:

<http://tn.gov/environment/topic/wr-wq-dw-drinking-water>

Division of Water Resources, Source Water Assessment Page:

<http://tn.gov/environment/article/wr-wq-source-water-assessment>

Activities related to watershed protection since the last Watershed Protection Report (2016) include:

- TDEC awarded approximately \$92.4 million dollars in Clean Water State Revolving Fund Loans to communities across Tennessee. (FY16)
- TDEC awarded approximately \$28.6 million dollars in Drinking Water State Revolving Fund Loans to communities across Tennessee. (FY16)
- In August of 2016, the United States Department of Agriculture (USDA) and the West Tennessee River Basin Authority began partnership in a nearly \$5.7 million investment in two targeted conservation projects in West Tennessee. The first agreement signed is a USDA NRCS Regional Conservation Partnership Program (RCPP)-Environmental Quality Incentives Program (EQIP) agreement and will establish a partnership framework for cooperation between NRCS and WTRBA on activities that will focus approximately \$1.9 million on 9 impaired or degraded watersheds in Hardin, Hardeman, Chester, and McNairy counties. The second partnership agreement—a Wetland Reserve Enhancement Program agreement, which is a component of the USDA NRCS Agricultural Conservation Easement Program-Wetlands Reserve Easement (ACEP-WRE)—will establish a mechanism for cooperation between NRCS and WTRBA to address priority wetland protection, restoration, and enhancement in the North and Middle Fork Forked Deer River system and will include eligible lands located in priority watersheds identified in Gibson, Madison, and Crockett counties.
- In 2015 TDEC posted a draft nutrient load reduction framework for Tennessee on the web (<http://www.tn.gov/environment/article/wr-ws-tennessee-nutrient-reduction-framework> ). TDEC is finalizing a companion implementation plan that will also be posted.



- TDEC, the Tennessee Valley Authority (TVA), the West Tennessee River Basin Authority (WTRBA), and The Nature Conservancy (TNC) completed four Tennessee Healthy Watersheds Initiative projects and initiated another that is still in progress:
  - Austin Peay State University: Determinations of the Currently Unknown Composition and Structure of Algae Assemblages in Middle Tennessee Streams Needed to Document and Monitor the Effects of Water Quality (multiple locations)
  - TNC, Virginia Chapter: Clinch Powell Clean Rivers Initiative-Enhancing Multi-Agency Coordination for Conservation Impacts Phase II (East Tennessee)
  - University of Tennessee (UT): Enhancing widespread water quantity and quality control through implementation and dissemination of the Tennessee Runoff Reduction Assessment Tool (RRAT) to assist in the design and evaluation of runoff reduction in Low Impact Development (LID) practices (applicable statewide)
  - West Tennessee River Basin Authority: Bailey Fork Creek Floodplain Restoration to Reduce Valley-Plug Expansion and Restore Bottomland Hardwood Forests (applicable throughout West Tennessee)
  - UT: Regenerative Stormwater Conveyances: An Innovative Watershed Management Tool for Tennessee (in progress & applicable statewide)
- In 2016, TDEC continued the Tennessee Healthy Watershed Initiative program by announcing the availability of funding and initiating a request for proposals process. Several projects under this initiative will be chosen in early 2017.

- TDEC, TVA, and the University of Tennessee continue to work on a collaborative project. Funded by TVA, the project seeks to work with the nursery industry in the Elk River's Robinson Creek subwatershed to study and recommend changes in irrigation and fertilization practices that lead to nutrient runoff.
- TDEC continued its role with the Clinch-Powell Clean Rivers Initiative (CPCRI), the team of agencies, universities and stakeholders working on conservation issues facing the Clinch and Powell Rivers. Goals set by CPCRI members include: 1) Protect critical riverside habitat, 2) Inventory and remediate abandoned mined lands, 3) Implement agricultural best management practices, and 4) Adopt a comprehensive science plan. USGS has initiated a research program, titled "Eastern Region Initiative on the Clinch (ERIC)," to provide a basic foundation of hydrological, biological, and geographical data. The CPCRI has been working with EPA and its contractor to analyze and illustrate biological, chemical, and physical characteristics of the Clinch and Powell Rivers. Through regularly scheduled webinars and an annual meeting, the team has shared information between states. Through an EPA grant, the initiative has completed a Healthy Watershed Initiative study of the Clinch and Powell Rivers Watersheds. The Clinch-Powell Initiative has launched a website (<http://cpcri.net/>) where the Healthy Watershed Report is found. Finally, Tennessee is collaborating with Virginia to prioritize restoration sites and to reintroduce native mussel populations.
- TDEC has been hosting and/or attending public outreach events in order to engage the public as part of Governor Haslam's Customer Focused Government. Division of Water Resources staff attended and/or hosted events in the Wolf River Watershed, the Tennessee Western Valley-Kentucky Lake Watershed, the Tennessee Western Valley-Beech River Watershed, the Buffalo River Watershed, the Collins River Watershed and the Lower Tennessee River Watershed. Event attendees heard about agency- and locally-led activities in the watershed that support water quality improvement and protection. The booths set up at each event provided the public with hands-on engagement in an interactive setting. TDEC has set up a storymap on the department's web site to make the meetings known to the public (<http://tdeconline.tn.gov/watershedstory/>).

- TDEC continues to mine its centralized databases for spatial information to create new GIS layers. Many of these layers are incorporated into GIS-based web applications that can be shared with staff and the public to provide better service and transparency. The Department's eTDEC initiative is focusing on how to store large amounts of digital information and provide solutions for customers and their regulated products (various permits or fees).
- TDEC is exploring solutions to create a more mobile workforce that can conduct business from the field and on-the-go in order to increase efficiency and effectiveness.
- TDEC, through its UT contractor, taught 15 Level I, 5 Level II, and 16 recertification classes (totaling 2,584 students) in the Erosion Prevention and Sediment Control Training and Certification Program. The training is available to those who are already covered by a stormwater construction permit issued by TDEC or have submitted a Notice of Intent for future construction activities. The training classes (Level I, Level II, and recertification) for contractors, developers, engineers, and other professionals are held across the state.
- A Green Development Grant cycle opened August 11, 2014 and all projects will be complete by January of 2019. Local governments in Tennessee were invited to submit proposals for grant funding to assist in implementing green infrastructure development projects. Green infrastructure refers to the use of systems and practices that use or mimic natural processes to infiltrate, re-use stormwater runoff generated at the site, or evapotranspire. Green infrastructure can be used in a wide range of landscape applications in place of, or in addition to, more traditional stormwater control measures. A total of \$103,080 in grant funds were awarded to local governments through a competitive process for projects. In addition, the grant provides for outreach and education designed to promote green development in Tennessee communities. The grants required a 20 percent local match.

Ongoing Green Development projects include:

- Johnson City: (\$25,000). The Johnson City public library, in conjunction with East Tennessee State University (ETSU), the City of Johnson City, LDA Engineering, and Siteworks Studios, are addressing stormwater runoff at the public library by installing an infiltration bed to capture the first inch of runoff from the library roof, provide storage capability for flood mitigation, provide natural habitat for pollinators, and provide aesthetic value to the library lawn. The library and ETSU will host community and school educational events, workshops, and guided tours on the green infrastructure.
- City of Ducktown: (\$25,000). The City of Ducktown, along with the Southeast Tennessee Development District, will install green infrastructure in the form of tree wells, pervious pavers, and bioretention cells to improve Spruce Street's stormwater drainage while also addressing water quality with the added benefit of making the street more attractive and accessible to pedestrians.
- City of Lewisburg: (\$23,080). The City of Lewisburg will use these funds as part of a comprehensive plan to improve the popular Rock Creek Park which hosts numerous festivals and events throughout the year. The city plans to remove 4,500 square feet of asphalt to create public green space. The existing parking lot will be replaced with pervious pavers to address stormwater runoff by providing a more natural infiltration of stormwater into the ground.
- City of Chattanooga: (\$10,000). The City of Chattanooga will develop and implement a LID model competition for students. The competition will recognize outstanding achievement in developing green infrastructure models and understanding of water quality as it relates to these practices. The competition will recognize individuals, schools, and teachers involved as well as cash prizes that will go towards further education concerning water quality and LID.

More information is available at:

<http://www.tn.gov/environment/topic/wr-green-development>

- TDEC continued to work with the TVA to implement riparian restoration projects. This multi-agency collaboration included TDEC, Tennessee Department of Agriculture (TDA), TVA, U.S. Fish and Wildlife Service (USFWS), Tennessee Wildlife Resources Agency (TWRA), Natural Resources Conservation Service (NRCS), Farm Services Administration (FSA), and Tennessee Stream Mitigation Program (TSMP).
- TDEC awarded two 604(b) Planning Grants:
  - South Central Tennessee Development District to characterize the Duck River using High Definition Stream Surveys (HDSS).
  - Upper Cumberland Development District to work with stakeholders to develop a watershed plan for Falling Water River Watershed
- TDEC, in partnership with TVA and the University of Tennessee (UT), is developing a feasibility study for nutrient trading. Building upon a 2008 UT report, the study will help determine the feasibility of point-to-nonpoint nutrient trading in Tennessee. Initially examining the Elk River watershed, the study will have statewide applicability.
- TDEC, as part of a multi-agency collaboration, reviews candidate low head dams for removal. The members of the committee (TDEC, TWRA, TNC, USFWS, Cumberland River Compact, and American Rivers) meet twice per year to prioritize the list and seek funding to implement dam removal. The prioritized list typically represents concrete or masonry weir-type structures, normally only a few feet tall, that were built many years ago to power gristmills and small industries. The list does not include farm (unless requested by the owner/operator), water supply lakes or power-generating dams.

Low head or run-of-river dams present a safety hazard to the public because of their capability of producing dangerous recirculating currents, large hydraulic forces, and other hazardous conditions sufficient to trap and drown victims immediately downstream from the overflowing water. Increasing numbers of kayakers, canoers, rafters, boaters, anglers, and swimmers are often unaware of, or underestimate, the dangerous forces and currents that these dams or similar hydraulic structures can produce. This type of dam removal also eliminates barriers to fish migration, relieves

stagnation, improves water quality, and increases biodiversity. (more information can be found at: <http://www.safedam.com/low-head-dams.html> )

In 2016, a decrepit low head dam on the Roaring River in Jackson County was permitted for removal.

- TDEC entered into an agreement with the City of Cookeville to do a Total Maximum Daily Load (TMDL) study in Falling Water River. The data collection phase of the project is now supporting a Total maximum Daily Load study that will be designed to restore water quality goals in impaired streams.
- TDEC has been working with water systems to identify ones vulnerable for Harmful Algal Blooms (HAB) by sharing a list of indicators provided by EPA. Thirty-two systems have been identified and TDEC is looking to form partnerships with them and the private sector to address them. Sampling was conducted in the spring of 2016 and no significant detections were found. The department will continue to look into the HAB cycle and how this might affect public water systems in the future.

### 3.0 TENNESSEE WATERSHEDS

#### 3.1 Definition

A watershed can be defined as the entire land area that ultimately drains into a particular watercourse or body of water. Watersheds vary in shapes and sizes, and are appropriate as organizational units because they are readily identifiable landscape units with readily identifiable boundaries that integrate terrestrial, aquatic, and geologic processes. Focusing on the whole watershed helps reach the best balance among efforts to control point source pollution and polluted runoff as well as protect drinking water sources and sensitive natural resources such as wetlands (EPA-840-R-98-001).

In the early 1970's, the USGS delineated 55 hydrologic watershed boundaries (HUC-8s, or 8-digit Hydrologic Unit Codes) within Tennessee. Proper names, as well as a unique grouping of numbers, are used to identify watersheds. For each watershed, this number is called the watershed's Hydrologic Unit Code, or HUC. The HUC can range from 2 to 16 digits long, more digits indicating that a smaller portion of the watershed is represented.



**Figure 1 Watersheds in Tennessee:** *Tennessee contains all or part of 55 HUC-8 watersheds which were delineated by the United States Geological Survey (USGS).*



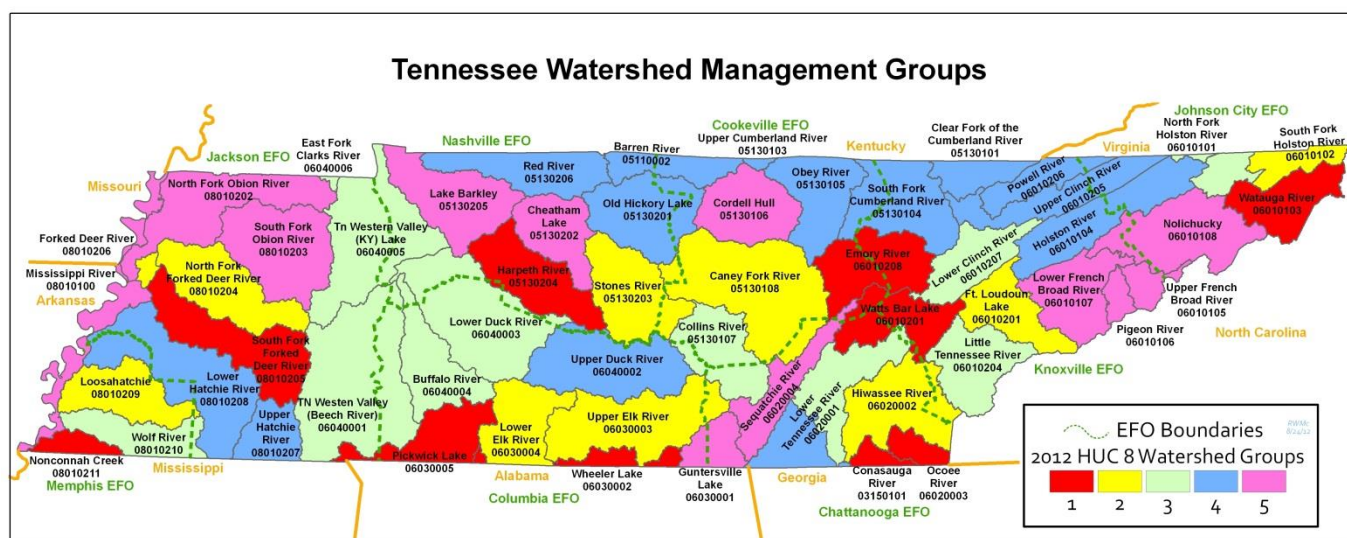
## 3.2 The Watershed Approach

In 1996, Tennessee began the watershed approach with the goals of making processes more Efficient (administratively), more Effective (consistent with basic ecological principles), and more Equitable (increase consistency in management decisions). Today, the division continues to apply these 3-E principles as we synchronize planning, monitoring, water quality assessment, TMDL development, restoration plan development and permitting activities through a 5 year watershed cycle.

In Tennessee, activities such as permitting, planning, and monitoring are coordinated using the Watershed Approach. This Approach utilizes features already in state and federal law, such as Water Quality Standards, the permitting program (National Pollutant Discharge Elimination System, or NPDES), TMDLs, Nonpoint Source Program, and ground water monitoring.

## 3.3 Watershed Planning

The 55 watersheds in Tennessee have been organized into five groups based on the year of implementation in a five-year cycle. The Division of Water Resources bases its activities for each group by the group's position in the cycle. The cycle also coincides with the issuance and duration of discharge permits.

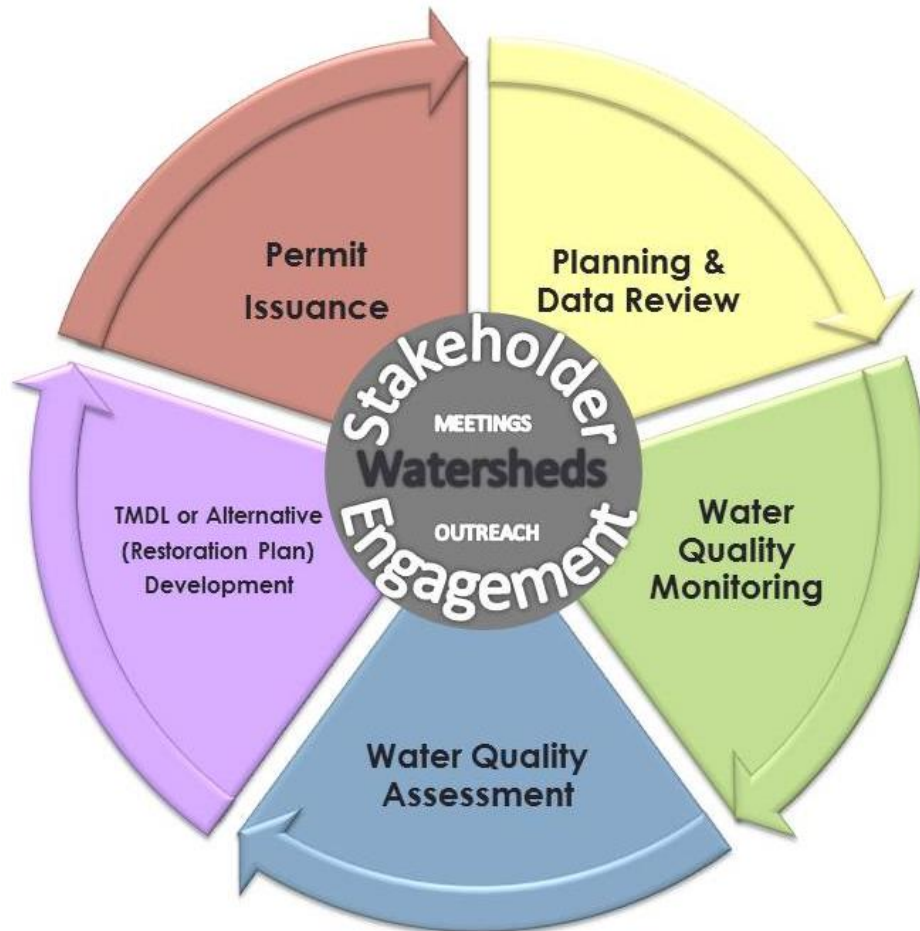


**Figure 2 Watershed Management Groups in Tennessee:** *Tennessee's watersheds are organized into five groups in the Watershed Approach.*



More information about Tennessee's Watershed Management Approach can be found on the department's website at:

<http://tn.gov/environment/article/wr-ws-watershed-management-cycle>



**Figure 3 Watershed Approach Cycle:** *Tennessee uses a five-year watershed cycle for watershed protection.*

The five key activities that take place during the five-year management cycle are:

**1. Planning and Existing Data Review.** Existing data and reports from appropriate agencies and organizations are compiled and used to describe the current conditions and status of lakes, rivers and streams. Reviewing existing data and comparing agencies' work plans guide the development of an effective monitoring strategy.

**2. Water Quality Monitoring.** Field data are collected for streams in the watershed. These data supplement existing data and are used for the water quality assessment.

**3. Water Quality Assessment.** Monitoring data are used to determine the status of the stream's designated use supports.

**4. TMDL or Alternative (Restoration Plan) Development.** Monitoring data and models (hydrologic and/or water quality) are used to analyze pollutant loads for permitted dischargers releasing wastewater in the watershed and to determine nonpoint source pollution contributions. The resulting TMDLs establish maximum allowable loadings of pollutants that a waterbody can receive while still meeting water quality standards. Alternatives to TMDLs that lead to waterbodies meeting water quality standards are also considered.

**5. Permit Issuance.** Issuance and expiration of discharge permits are synchronized based on watersheds. Currently, over 1,700 permits have been issued in Tennessee under the federally delegated National Pollutant Discharge Elimination System (NPDES) permit program.

Stakeholder involvement opportunities occur throughout the entire five-year cycle. Division of Water Resources Staff attend or host watershed outreach events which are interactive and designed to engage the public. Stakeholders have an opportunity to interact with representatives from federal, state, and local governments, universities, and nongovernment organizations about activities in the watershed that lead to improved water quality and learn how they can be a part of these activities.

Tennessee's Watershed Approach, Watershed Water Quality Management Plans, updates, and public participation opportunities, are found on the web at:

<http://tn.gov/environment/article/wr-ws-watershed-management-approach>

## **4.0 POINT AND NONPOINT SOURCE POLLUTION CHALLENGES TO WATERSHED PROTECTION**

Water quality is impacted by both point and nonpoint source pollution. Tennessee uses the Watershed Approach to integrate point and nonpoint contributions in order to understand the challenges and identify the solutions necessary to improve water quality.

### **4.1 Point Sources of Pollution**

Point Source pollutants are typically discharged through a discrete conveyance like a pipe or ditch. In the Clean Water Act, a point source is defined as any discernible, confined, and discrete conveyance including, but not limited to, any pipe, ditch, channel, conduit, tunnel, well, discrete fissure, container, rolling stock, Concentrated Animal Feeding Operation (CAFO), landfill leachate collection system, vessel or other floating craft from which pollutants are or may be discharged. This term does not include return flows from irrigated agriculture or agricultural stormwater runoff.

The Division of Water Resources has authority to regulate this type of discharge through its NPDES program. Permits issued to municipalities, industries, and some agricultural operations are based on the protection of criteria set out in the state's water quality standards. More information about the point source permitting program is available at:

<http://tn.gov/environment/topic/subpermits-npdes>

#### 4.1.A Issue of Concern

**Unavailable Waters.** The 303(d) List is a compilation of the streams and lakes in Tennessee's watersheds that are water quality limited for a parameter or expected to exceed water quality standards in the next two years and need additional pollution controls. Water quality limited streams are those that have one or more properties that violate water quality standards after technology-based effluent limitations have been put in place. They are considered impaired by pollution and not fully meeting designated uses, and therefore unavailable for additional pollutant loading for that parameter.

Once a stream has been placed on the 303(d) List, it is considered a priority for water quality improvement efforts. These efforts include traditional regulatory approaches such as permit issuance, but also include efforts to control pollution sources that have historically been exempted from regulations, such as certain agricultural and forestry activities.

TDEC uses its regulatory authority to control point source pollution that are causes of impairment in watersheds. TDEC's draft 2016 303(d) List is at: <http://www.tn.gov/environment/article/wr-wq-water-quality-reports-publications>

A new, updated, 303(d) List will be submitted to EPA in 2018.

Tennessee's 305(b) Report (The Status of water Quality in Tennessee) can be found on the division's publications page:

<http://tn.gov/environment/article/wr-wq-water-quality-reports-publications>

**Stormwater.** EPA and state water quality agencies have realized the severe impact that rainwater runoff from urban and urbanizing areas has on surface waters. Rainwater falling on industrial sites, urban areas, and construction sites can become contaminated with runoff loaded with sediments, bacteria, suspended solids, nutrients (phosphorus and nitrogen), metals, pesticides, organic material, and floating trash. These pollutants are then carried to surface waters. Unlike sanitary wastewater and industrial wastewater, most stormwater is not treated prior to entering streams. Pollution of stormwater runoff must be prevented at the source.

Federal, state, and local governments have passed laws and regulations to address the problem of polluted runoff. EPA initiated a national stormwater permitting program in the early 1990s that applied to industrial activities, construction sites of five acres or more, and urban runoff from larger cities (Phase I).

Phase II regulations later addressed additional urbanized areas, certain cities with a population over 10,000, and construction activities of one acre or more. In Tennessee, TDEC implements the Phase I and Phase II programs through authorization from EPA.

Based on recent census and water quality data, no new municipalities were required to obtain coverage under the NPDES Municipal Separate Storm Sewer System (MS4) permit program and develop and implement programs for control of stormwater runoff quality in 2015. The total number of regulated stormwater collection systems operators remains at 96. The success of these programs will determine to a large extent the degree to which clean water goals are achieved in urban municipal areas.

MS4s have an opportunity to apply for Qualifying Local Program (QLP) status, under which they participate with TDEC in standardized interagency enforcement protocols and the QLP status is recognized as an alternative measurement of MS4 effectiveness. Obtaining QLP status is optional, but all MS4s are encouraged to consider participation. Open enrollment for new Qualified Local Program (QLP) candidates began July 1, 2013. TDEC received one application to participate in the program in 2016. From the City of Kingsport and expects to receive several more in the future.

The most significant benefits of a QLP include:

- A more streamlined and efficient process for managing construction stormwater by eliminating permit and review duplication at the local and state levels
- Eliminating additional effort at the state level for construction site operators by providing only one set of requirements to follow; and
- A more effective construction stormwater program resulting in greater water quality protection.

Current QLPs are Bristol, Cookeville, Knox County, Knoxville, and Washington County.

More information on the QLP is on the TDEC website at:

<http://tn.gov/environment/article/tennessee-qualifying-local-program>

**Mining.** Mining activity from coal and non-coal mine sites discharge treated wastewater and stormwater runoff. Activities at mine sites may also involve disturbance of water features such as streams and wetlands in conjunction with an ARAP and 401 Certification from the Division's Mining Section. Controlling these sources is critical to protecting waters and watersheds in our state.

Coal mining has a long history of economic importance to the Cumberland Plateau and East Tennessee communities, and a legacy of environmental impact as well. Siltation/sedimentation, acid mine drainage (AMD), and metals from improper mining practices and controls can impact streams. While wastewater discharges from coal mines are regulated under the NPDES program in Tennessee, surface mining permits for coal mining in Tennessee are issued by the U.S. Department of Interior, Office of Surface Mining, Reclamation, and Enforcement (OSMRE) under federal mining laws. This includes the reclamation of the mine site. All such permits are consistent with the stream buffer zone requirement that the General Assembly enacted in 2009 known as the Responsible Miners' Act of Tennessee. That law prohibits mining or disposal of waste or overburden material into a stream or within 100 feet on either side of one.

Operators who engage in mineral mining and surface disturbances, as per the 1972 Tennessee Surface Mining Law, are required to obtain a state surface mining permit, from the Tennessee Division of Water Resources Mining Section, an NPDES permit must accompany the surface mining permit. In all counties, mining of the following minerals requires a surface mining permit: clay, stone, phosphate rock, metallic ore and any other solid material or substance of commercial value found in natural deposits on or in the earth. More information about TDEC's mining program is found at:

<http://tn.gov/environment/topic/wr-mining-information-permits>

On October 1, 2010, the State of Tennessee filed a Lands Unsuitable for Mining (LUM) petition with the federal government requesting ridgelines on land managed for public use on the Northern Cumberland Plateau be deemed unsuitable for surface coal mining. The petition area reflects a ridgetop corridor encompassing 67,326 acres notable for its old growth forest as well as a diverse array of habitats and wildlife, some of which are considered rare or threatened. These lands are managed by the state for hunting, hiking, wildlife viewing, and other outdoor recreational activities. The petition asks the federal government to help prevent surface mining on these ridgelines to protect their important cultural, recreational, and scientific resources for future generations. Preventing surface mining on these ridgelines would also provide essential protection for vital headwater streams that supply key river systems, including Exceptional Tennessee Waters and Outstanding National Resource Waters. Upon receiving a complete petition, the federal Office of Surface Mining must prepare an Environmental Impact Statement (EIS). This process provides an opportunity for public input prior to a decision being made about whether to designate the petition area as LUM. The petition does not affect underground mining or permits for surface mining that have already been issued, nor does it cover any areas in which historical mining has resulted in water pollution from acid mine drainage where re-mining could help improve environmental impacts. On November 23, 2010, OSMRE informed Tennessee that the petition was deemed complete.

No new mining permits were to be issued within the proposed petition area while the petition was under review. Eight environmental groups, three industry groups, and Campbell County intervened on behalf of their constituents. OSMRE has cooperated with EPA, the US Fish and Wildlife Service, and the National Park Service to complete the combined Petition Evaluation Document/Environmental Impact Statement (PED/EIS).

Studies on socioeconomics, recreation, aquatic resources, soundscape, and viewshed aesthetics required to evaluate the petition are complete. The National Park Service's Denver Science Center has signed an interagency agreement with OSRME to facilitate OSRME's management of the review process. In July 2014, OSRME secured contractor services to prepare and publish the review document.

On December 11, 2015, OSMRE and the Department of the Interior (DOI), upon finding merit to the state's petition, announced a draft proposal and draft EIS along with a 45-day public comment period, and released six action alternatives. The preferred alternative chosen at that time was Alternative 3. Under that alternative, OSM would designate as unsuitable for surface coal mining all public lands in the State's petition. This area included 505 miles of ridgelines with a 1200 foot corridor (600 feet on either side of each ridgeline) for a total of 67,326 acres. The designation would not have prohibited underground mining and auger mining that was based outside the petition area as long as it caused no surface disturbances within the petition area. Re-mining would also have been allowed pursuant to 30 CFR 785.25 to engage in surface coal mining to reclaim previously mined areas, as well as the development and use of access and haul roads to facilitate re-mining activities. Under this alternative, there was the potential to eliminate 183.7 of the 201.6 miles of high wall identified by re-mining.

The 45-day public comment period on the proposal and EIS began on December 11, 2015 and ended on January 25, 2016. To view the PED/EIS and other supporting documents, visit: <http://www.osmre.gov/programs/rcm/TNLUM.shtm?platform=hootsuite>

OSMRE held four public hearings in January 2016. The dates and locations were:

Monday, January 11, 2016  
Wartburg Central High School  
1119 Knoxville Highway  
Wartburg, TN 37887

Tuesday, January 12, 2016  
Roane State Community College/O'Brien Theater  
410 W.H. Swain Blvd  
Huntsville, TN 37756

Wednesday, January 13, 2016  
Clinton Community Center  
101 Hicks Street  
Clinton, TN 37716



Thursday, January 14, 2016  
Campbell County High School  
JROTC Room  
150 Cougar Lane  
Jacksboro, TN 37757

Upon receiving public comments and subsequent evaluation by OSM, Alternative 4 is now the chosen alternative. This alternative, the Expanded Corridor with Potential Re-mining and Road Access Alternative, designates 569 miles of ridgeline (1200 foot corridor) and includes 76,133 acres for protection. It includes the ridgelines proposed in the state's petition plus additional ridgelines identified by OSM. With this new alternative, 219.5 miles of high wall are now subject to re-mining. This is an actual increase in the potential re-mining areas when compared to Alternative 3 with the added benefit of increased acreage and ridgelines for any new surface disturbance.

More information about the Lands Unsuitable for Mining petition is available at <http://www.osmre.gov/programs/rcm/TNLUM.shtm>

#### **4.1.B Restoration Programs and Tools**

**Total Maximum Daily Loads (TMDLs).** Section 303(d) of the Clean Water Act establishes the TMDL program which: 1) quantifies the amount of a pollutant in a stream, 2) identifies the sources of the pollutant, and 3) recommends regulatory or other actions that may need to be taken in order for the stream to cease being polluted. Some of the actions that might be taken are:

- Reallocation of limits on the sources of pollutants documented as impacting streams. It might be necessary to lower the amount of pollutants being discharged under NPDES permits or to require the installation of other control measures, if necessary, to ensure that water quality standards will be met.

- For sources the division does not have regulatory authority over, such as ordinary agricultural or forestry activities, provide information and technical assistance to other state and federal agencies that work directly with these groups to install appropriate Best Management Practices (BMPs).

More information on Tennessee's TMDLs program is available on the TDEC web site:

<http://tn.gov/environment/article/wr-ws-tennessees-total-maximum-daily-load-tmdl-program>

**Abandoned Mine Reclamation Program.** Abandoned coal mines pose serious threats to public health, safety and welfare as well as degrade the environment. The programs of the TDEC Land Reclamation Section accomplish three important things: 1) They remove dangerous health and safety hazards that threaten the citizens of Tennessee, 2) They improve the aquatic environment, and 3) They restore resources to make them available for economic development, recreation, and other uses. Problems typically addressed by the land reclamation program include open or improperly filled mine shafts, dilapidated mine buildings and equipment, toxic mine refuse and drainage, landslides, mine fires, highwalls and subsidence. Tennessee Code Annotated 59-8-324 authorizes the program. Although current mining operations often reclaim some scars from old mining operations, this represents a small portion of the abandoned mine land and it rarely addresses the more serious threats to human health and safety. More information is on the TDEC web site at:

<http://tn.gov/environment/topic/wr-mining-information-permits>

**State Revolving Fund (SRF) Loan Program.** Failing or insufficient water and wastewater treatment systems and wastewater treatment systems threaten the safety of Tennessee's watersheds and water supplies. A useful tool to address these problems is the Clean Water SRF (CWSRF) Loan program, which TDEC uses to provide low interest loans for water quality improvement projects.

An amendment to the federal Clean Water Act in 1987 created the CWSRF loan program in order to provide low-interest loans to cities, counties, and utility districts for the planning, design, and construction of sanitary wastewater facilities. The U.S. EPA awards annual capitalization grants to fund the program, and the State of Tennessee provides a twenty-percent funding match. The SRF Loan Program has awarded CWSRF loans totaling over \$1.7 billion since the creation of Tennessee's CWSRF Program. Loan repayments are returned to the program and used to fund future CWSRF loans. Tennessee's draft Clean Water SRF Intended Use Plan is available at:

<http://www.tn.gov/environment/article/wr-srf-priority-ranking>

The SRF Loan Program also administers Tennessee's Drinking Water State Revolving Fund (DWSRF) Loan Program. An amendment to the federal Safe Drinking Water Act in 1996 created the DWSRF Program in order to provide low-interest loans to cities, counties, and other utilities for the planning, design, and construction of public drinking water facilities. The U.S. EPA awards annual capitalization grants to fund the program, and the state of Tennessee provides a twenty-percent funding match. The SRF Loan Program has awarded DWSRF loans totaling over \$288 million since the creation of Tennessee's DWSRF Program. Loan repayments are returned to the program and used to fund future DWSRF loans. Tennessee's Drinking Water SRF Intended Use Plan is available at:

<http://www.tn.gov/environment/article/wr-srf-priority-ranking>

## **4.2 Nonpoint Sources of Pollution**

Nonpoint sources are diffuse pollution sources (i.e., without a single point of origin or not introduced into a receiving stream from a specific outlet). The pollutants are generally carried off the land by stormwater. The Division of Water Resources works with the Tennessee Department of Agriculture (TDA), UT-Extension, and the US Department of Agriculture Natural Resources Conservation Service (NRCS) to encourage farmers to install Best Management Practices (BMPs). The installation of these BMPs is voluntary and there are often cost-share opportunities for farmers.

Two grant programs make up TDA's Land and Water Stewardship Section: the Nonpoint Source Program (TDA-NPS) and the Agricultural Resources Conservation Fund (TDA-ARCF). Both fund proposals from agencies, non-profit organizations (watershed groups), and universities that will reduce water pollution.

The TDA-NPS program administers the Section 319(h) of the Federal Clean Water Act. The program is non-regulatory, promoting voluntary, incentive-based solutions. It funds three types of projects:

1. BMP Implementation Projects. These projects improve an impaired waterbody, or prevent waters from becoming impaired.
2. Monitoring Projects. Up to 20% of the available grant funds can assist water quality monitoring efforts in Tennessee streams, both in the state's watershed monitoring program, and also in performing before-and-after monitoring following BMP installation, so that water quality improvements can be verified. TDEC Division of Water Resources receives some funds from TDA to conduct water quality monitoring.
3. Educational Projects. These projects raise public awareness of practical steps that can be taken to eliminate nonpoint sources of pollution.

The TDA-ARCF provides cost-share assistance to Tennessee landowners to install BMPs that eliminate agricultural nonpoint source pollution. This assistance is provided through Soil Conservation Districts, Resource Conservation and Development Districts, Watershed Districts, universities, and other groups. In addition, a part of the TDA-ARCF is used to fund educational projects statewide, with a focus on landowners, producers, and managers of farms and forests.

More information is available at <http://www.tn.gov/agriculture/topic/water>

NRCS provides technical advice and money to landowners willing to install BMPs in accordance with programs described in the federal Farm Bill. Local District Conservationists (approximately one per county) work with landowners to identify voluntary projects that qualify for funding.

NRCS employees provide technical assistance based on sound science and suited to a landowner's specific needs. The agency provides financial assistance for many voluntary

conservation activities. The Conservation Technical Assistance (CTA) program provides voluntary conservation technical assistance to land-users, communities, units of state and local government, and other federal agencies in planning and implementing conservation systems. More information about NRCS conservation programs is available at <http://www.nrcs.usda.gov/>

## **5.0 DRINKING WATER**

Safeguarding human health by ensuring safe drinking water for the people of Tennessee is a primary mission of TDEC. The Division of Water Resources is responsible for administering the provisions of the Tennessee Safe Drinking Water Act as well as the Tennessee Water Quality Control Act of 1977 (T.C.A. 69-3-101). The Tennessee Board of Water Quality, Oil, and Gas administers both the Tennessee Safe Drinking Water Act and the Water Quality Control Act.

### **5.1 Drinking Water Supply**

TDEC's Division of Water Resources has responsibility for regulating public water systems and ensuring that Tennessee's citizens have safe drinking water. As a part of this responsibility, the division has developed a Source Water Protection Program for public water systems. A water system works with TDEC personnel as well as other states in (those cases where the source water protection area crosses state lines), federal, and local agencies and non-governmental organizations to promote success of the source water protection program.

An important step toward prevention of contamination of public water supplies is the federal Safe Drinking Water Act Amendments of 1986. At that time, each state was required to develop a wellhead protection program to protect the water source of public water systems relying on ground water (wells or springs). The new source water assessment provisions in the federal Safe Drinking Water Act of 1996 Amendments expanded the scope of protection beyond ground water systems to include protection of the waters supplying surface water systems.

Water sources for Tennessee's public drinking water supplies vary considerably across the state. The predominant source of water for West Tennessee is ground water, whereas in Middle Tennessee it is surface water. East Tennessee relies on both ground water and surface water, with the ground water sources frequently being springs. Appendix A contains a listing of water systems and their water sources.

Approximately 2/3 of the community public water systems using ground water in Middle and East Tennessee have had at least one source determined to be under the direct influence of surface water. This means that these sources of groundwater are located close enough to a source of surface water to receive direct surface water recharge and are thus considered at risk from surface water contaminants and pathogens.

Each year, all public water suppliers are required to review their well head or source water protection area for any changes that may have occurred. These are reported to the state in three-year intervals for community systems and every year for non-community systems.

## 5.2 Threats to Water Sources

As the sources for our drinking water vary across the state, so do the types of threats to which those water sources may be subject. The State-EPA Nutrient Innovations Task Group released a document in August 2009 entitled "An Urgent Call to Action" which is available at: <https://www.epa.gov/sites/production/files/documents/nitgreport.pdf>

Water systems threatened by nutrients, pathogens, and Total Organic Carbon (TOC) are illustrated in Appendix B.

Typical ground water threats are chemical contaminants such as petroleum products and derivatives. These would include gasoline constituents and chlorinated solvents. For ground water impacted by surface water, surface water contaminants play a role as well. Typical surface water concerns include siltation/sedimentation, pathogens, and nutrients.

## 5.2.A Drought Impact

In recent years, Tennessee had a number of water systems influenced by drought which caused some systems to institute water restrictions. Many of these water systems were impacted—not by their diminishing water—but by hydraulic or treatment capacity issues due, in large part, to the amount of irrigation of lawns, gardens, and car washing. In some cases, assimilative capacity is the major determining factor in setting minimum flow/discharge rates for streams. This, in turn, has an effect on the amount of water that can be drawn by water treatment plants. By September of 2016 drought conditions once again began to enter the Tennessee Valley. Tennessee is currently monitoring several systems that are experiencing drought. The Division developed a web page to provide information to the citizens of Tennessee regarding drought and impacts that the drought is having on Tennessee's water supplies. The web site is at: <http://tn.gov/environment/topic/wr-drought-planning>

## 5.2.B Emerging Problems

Across the U.S., emerging problems are:

- Cryptosporidium
- Disinfection byproducts
- Human and veterinary pharmaceuticals
- Synthetic Organic Compounds (SOCs)
- Harmful Algal Blooms

Tennessee's drinking water providers have concluded the first round of source water sampling under the Long Term Surface Water Treatment Rule—Part 2. The second round is currently underway. This sampling is for Cryptosporidium to determine if additional treatment is necessary. As of December 1, 2009, community systems relying on ground water are required to maintain disinfection at a level for 4-log-removal of viruses (99.99%) and continuously monitor effective chlorine residual as a part of the new Ground Water Rule. Very small community and non-community systems (churches, schools, restaurants, and industries) using ground water are required to complete source water monitoring when bacteria have been detected within the system.

Disinfection byproducts are tested under the Disinfection Byproducts Rule which relates to the age of the treated water and chlorine's reaction with naturally occurring organics. As of January 1, 2010, wholesale water systems are required to work with purchasing water systems where the purchasing system has violations from disinfection byproducts (trihalomethanes and haloacetic acids) when the water the purchasing system is receiving is already at or more than 60% of the drinking water standard (Disinfection byproducts are the result of chlorine's reaction with organic molecules in the source water). The removal of organic carbon in the water treatment process is critical to maintaining the drinking water standards for trihalomethanes and haloacetic acids. Watershed protection is crucial in preventing the compromise of supplying streams by excessive organic loadings. There continues to be a small number of systems that have had disinfection byproduct concentrations slightly above the standards.

Over the past decade, water quality surveys have indicated that numerous areas of the United States, including Tennessee, have pharmaceuticals and steroid hormones in their waterways. Additional studies have linked the exposure of fish and amphibians to natural and synthetic steroids to reproductive and endocrine disruption (estrogens and/or androgens). Within the State of Tennessee, little is currently known about the potential for pharmaceutical compounds and/or endocrine disrupting compounds to contaminate drinking water supplies. Therefore, TDEC began a project to sample raw (untreated) water from all community water system's source water. In this project we surveyed waters in Tennessee (surface water and ground water) for the presence of both pharmaceutical compounds and endocrine disrupting compounds. This project was funded from an EPA grant through 2011.

While this is a national concern, no water systems in Tennessee were identified with pharmaceuticals above any published health-based standards or other guidance-based levels. In addition, no drinking water supplies in Tennessee are currently known to be compromised by high levels of cryptosporidium, disinfection byproducts, or pharmaceuticals in Tennessee.



Tennessee's EPA approved Synthetic Organic Compounds (SOC) monitoring waiver program required that community and non-transient non-community water systems sample for a reduced number of SOC's during the growing season in 2014, 2015 or 2016 (current monitoring period). Systems were sent letters in April of 2014 notifying them which SOC's were to be sampled based on United State Geological Survey pesticide surveys relative to the counties that the systems' source water protection areas fell within and type of water source (surface water, ground water under the influence of surface water or true ground water sources). A substantial number of systems chose to do their sampling in 2014 and 2015.

## 5.3 Other Issues

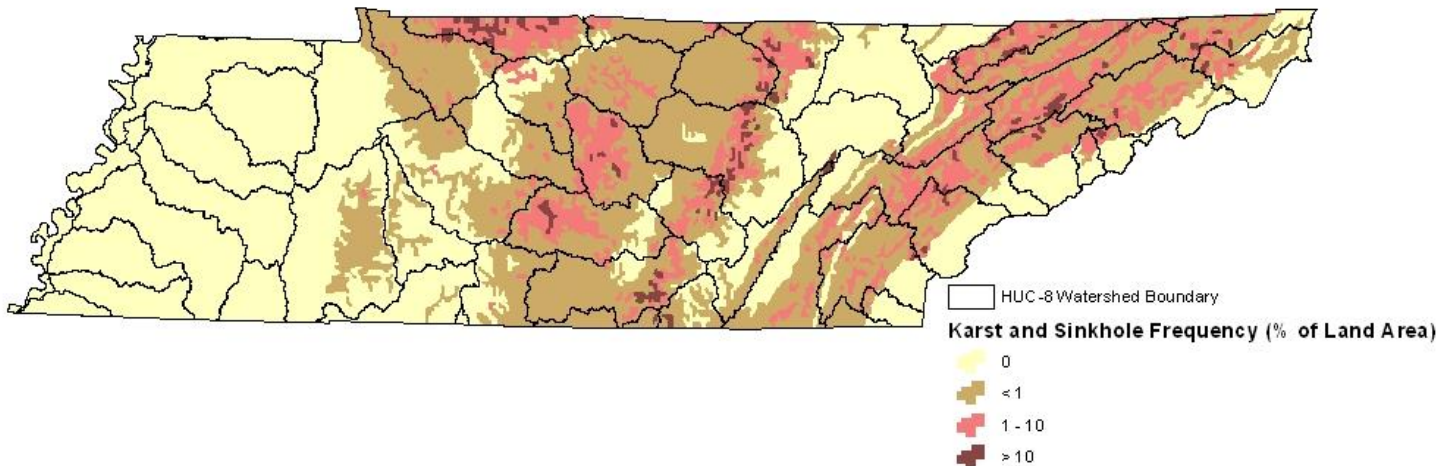
### 5.3.A Karst

Tennessee has an abundance of karst (Figure 4) which is highly susceptible to contamination. Karst is characterized by rock formations with sinkholes, springs, disappearing streams and caves; as well as by rapid, highly directional ground water flow in discrete channels or conduits. Karst systems may be easily contaminated since the waters can travel long distances through conduits with no chance for natural filtering processes of soil or bacterial action to diminish the contamination. Transport times across entire karst flow systems may be as short as hours or weeks; orders of magnitude faster than that in sand aquifers.

Ground water was once thought to be safe from contamination, but there is an increasing awareness that ground water needs to be monitored and protected as a valuable resource. Ground water can be quite vulnerable to contamination, particularly in limestone areas or in unconfined sand aquifers (water bearing zones). This vulnerability is particularly true for contamination from the highly mobile and widely used volatile organics (chlorinated solvents and gasoline components) and pathogenic microorganisms (bacteria and protozoa).

Water in karst areas is not distinctly surface water or ground water. In unconfined or poorly confined conditions, karst aquifers have very high flow and contaminant transport rates under rapid recharge conditions such as storm events. This is a particular concern for public water systems using wells or springs in karst areas where pathogenic organisms that would not be present in true ground water can survive in ground water under the influence of surface water. TDEC concluded an EPA-funded study of karst terrain in five subwatersheds in the Red River Watershed (in Montgomery, Robertson, and Stewart Counties) in 2011.

## KARST AREAS OF TENNESSEE



**Figure 4 Karst Areas of Tennessee**

### 5.3.B Mercury in Bridges

As part of an ongoing investigation, TDEC has identified 97 locations scattered throughout Wayne, Hickman, and Lewis counties where “bridge” panels containing elemental mercury are present. The “bridges” consist of former mercury cell parts from a former chlor-alkali plant that were installed as small bridges on public roads and private driveways. The mercury is found on the underside of the bridges in grout-like material similar to concrete. The identified locations include 83 bridges, 13 locations with loose panels (not used as bridges), and 1 location where a panel is part of a roadway retaining wall.

Bridges suspected of containing mercury have been stabilized to prevent further release of mercury, and there is an ongoing action to remove and replace these bridges in a manner that allows transportation access to county residents. As of November 2016, 64 bridges have been removed and replaced. Samples of surface water, wetlands, and fish tissue do not indicate the need for stream postings or fish consumption advisories; however, the evaluation of area streams and fish will continue as the remaining bridges are removed.

### 5.3.C Regional Water Supply Planning

TDEC partnered with the federal and state agencies, nongovernmental organizations and other regional planning experts to form a Water Resources Technical Advisory Committee (WRTAC) and to initiate a water resources planning pilot in two areas significantly impacted by the drought of 2007.

WRTAC was authorized by the Tennessee Water Resources Information Act in 2008. One of the first tasks that the committee completed was the development of a framework for regional water supply planning. The committee then developed a rationale for establishing a ranking system for regional water supply plans as it relates to the state Revolving Fund (SRF) funding. This will allow regional plans to receive a higher ranking in the funding formula and also allows a quicker review of regional plans with respect to TDEC reviews.

To fulfill a portion of the commissioner's charge to the WRTAC, the committee has produced a "Statewide System of Basic Hydrologic and Water System Information," and produced the "Regional Water Supply Plans Approval Process for Tennessee". The WRTAC reports can all be found on the TDEC web site at:

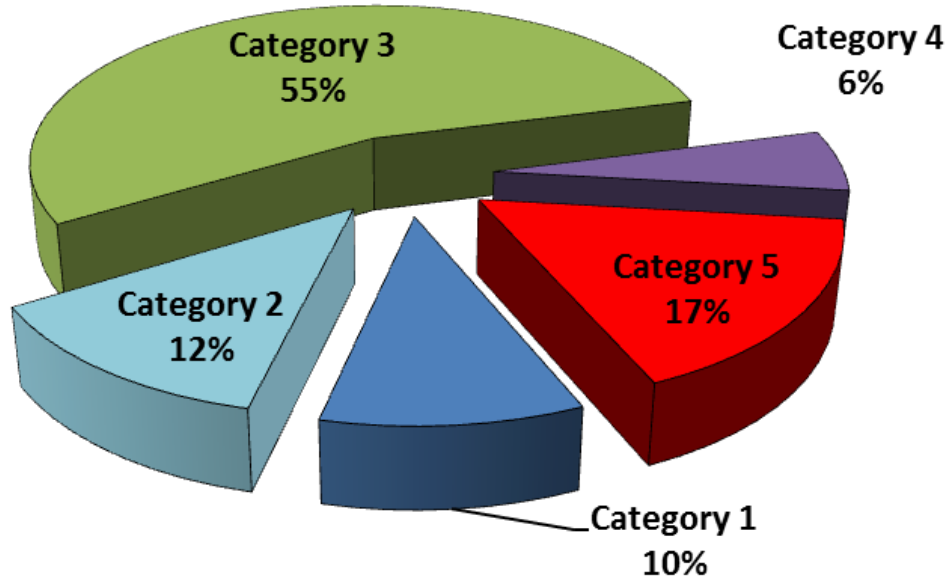
<http://www.tn.gov/environment/article/wr-wq-water-resources-regional-planning>

## **6.0 WATER QUALITY**

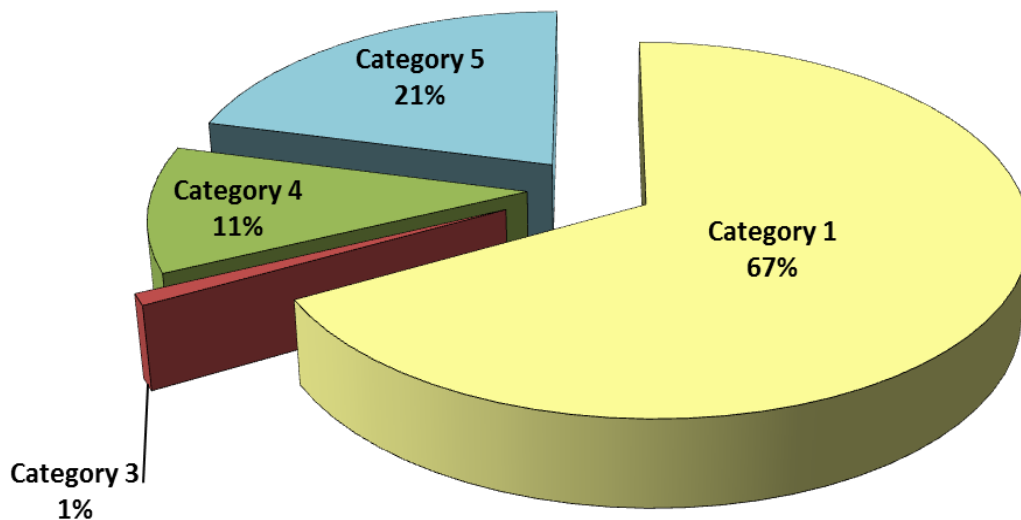
### **6.1 Surface Waters**

The Division of Water Resources monitors surface waters and compares results with the criteria set out in Tennessee's Water Quality Standards (Rule Chapter 400-40-03). A number of specific surveys are conducted, including studies of in-stream biological communities, chemical studies, probabilistic studies, and documentation of contaminant levels in sediment and fish flesh. The fish and bacteriological data generated by the division are used by TDEC to issue advisories to the public when levels of contaminants exceed those considered to be protective of public health.

Tennessee produces a document every two years called The Status of Water Quality in Tennessee. Also called the 305(b) Report (for the Section of the Clean Water Act requiring it), the report summarizes the status of water quality and the leading causes of impairment in each of Tennessee's watersheds.



**Figure 5 Water Quality Status of Rivers & Streams in Tennessee:** *as illustrated in the 2014 305(b) Report.*



**Figure 6 Water Quality Status of Lakes & Reservoirs in Tennessee:** *as illustrated in the 2014 305(b) Report.*

## **Integrated Report Categories:**

**Category 1:** waters are fully supporting of all designated uses. These streams, rivers, and reservoirs have been monitored and meet the most stringent water quality criteria for all designated uses for which they are classified. The biological integrity of Category 1 waters is favorably comparable with reference streams in the same subcoregion and pathogen concentrations are at acceptable levels.

**Category 2:** waters are fully supporting of some designated uses, but have not been assessed for all uses. In many cases, these waterbodies have been monitored and are fully supporting of fish and aquatic life but have not been assessed for recreational use.

**Category 3:** waters are not assessed due to insufficient or outdated data. However, streams previously identified as impaired are not moved to this category simply because data are old.

**Category 4:** waters are impaired, but a TMDL has been completed or is not required. Category 4 has been further subdivided into three subcategories.

**Category 4a:** impaired waters that have already had all necessary TMDLs approved by EPA.

**Category 4b:** impaired waters do not require TMDL development since "other pollution control requirements required by local, state or federal authority are expected to address all water-quality pollutants." An example of a 4b stream might be where a discharge point will be moved in the near future to another waterbody with more assimilative capacity.

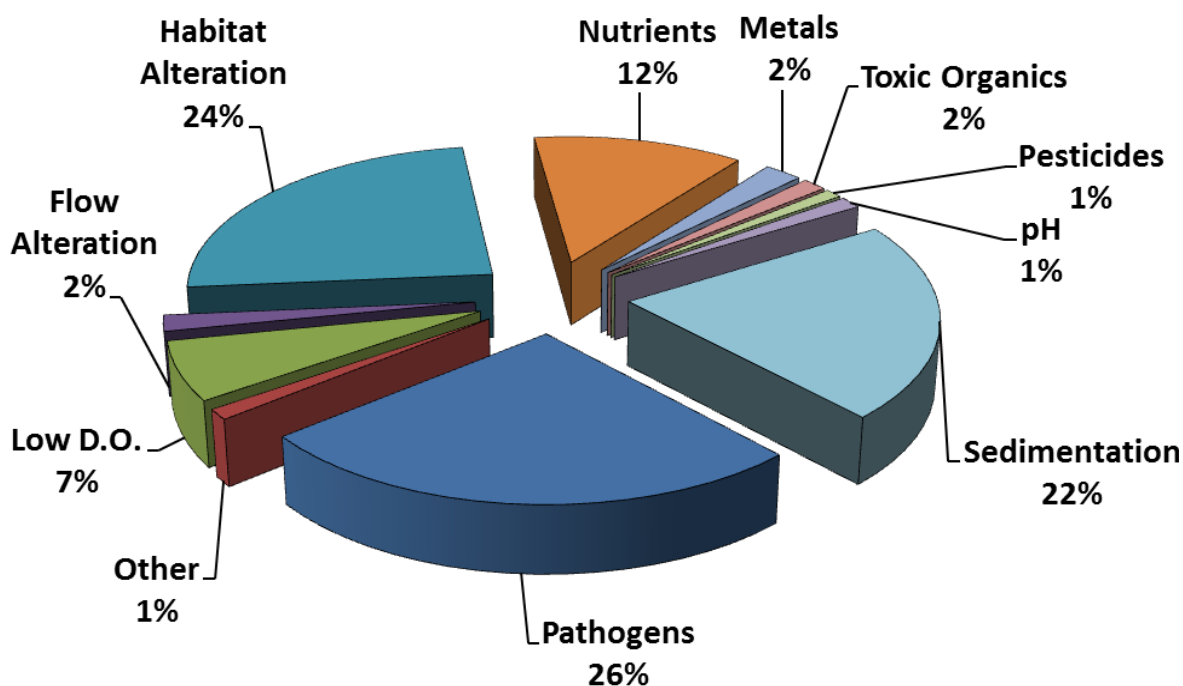
**Category 4c:** impaired waters in which the impacts are not caused by a pollutant (e.g., flow alterations).

**Category 5:** waters have been monitored and found not to meet one or more water quality standards. These waters have been identified as not supporting their designated uses. Category 5 waterbodies are moderately to highly impaired by pollution and need to have TMDLs developed. These waters are included in the 303(d) List of impaired waters in Tennessee.

The current 305(b) Report is available at:

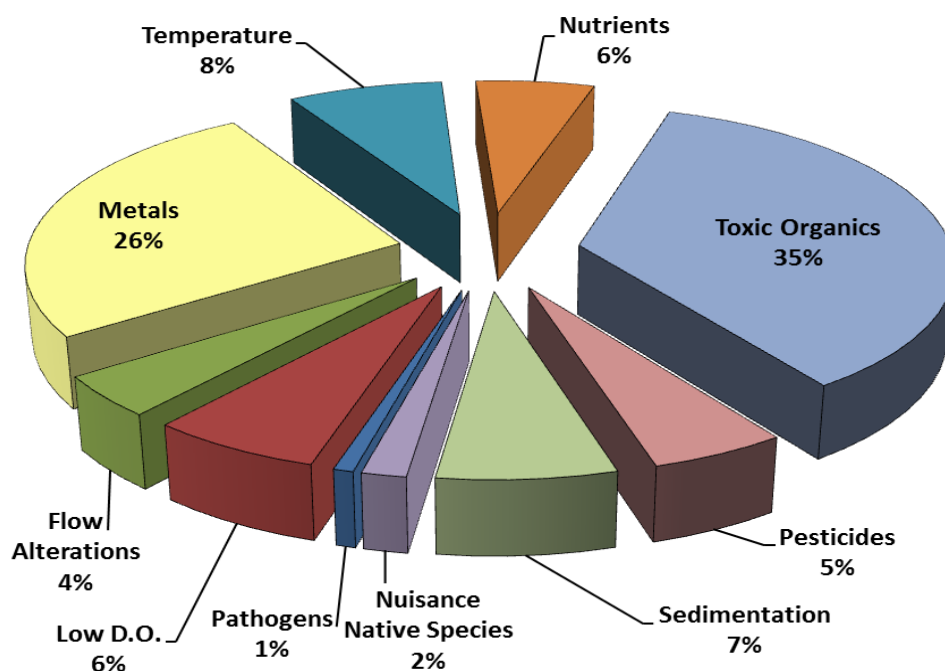
<http://www.tn.gov/environment/article/wr-wq-water-quality-reports-publications>

The 2014 305(b) Report indicates that pathogens, habitat alterations, siltation, and nutrients are the leading causes of impairment in Tennessee streams.



**Figure 7 Relative Impacts of Pollution on Impaired Rivers & Streams in Tennessee:** *as illustrated in the 2014 305(b) Report.*

The 2014 305(b) report identifies organics, metals, and low dissolved oxygen as the leading causes of impairments in Tennessee lakes



**Figure 8 Relative Impacts of Pollution on Impaired Lakes & Reservoirs in Tennessee:**  
*as illustrated in the 2014 305(b) Report.*

The Division of Water Resources also prepares a 303(d) List every two years, which is a list of streams, rivers, reservoirs, and lakes that do not meet water quality standards even after technology-based effluent limitations are in place. The draft 2016 303(d) List is available at:

<http://www.tn.gov/environment/article/wr-wq-water-quality-reports-publications>

Additional information about surface water monitoring in Tennessee watersheds is found in the Watershed Water Quality Management Plans. These plans are available for viewing at <http://tn.gov/environment/topic/wr-ws-basin-watersheds-by-basin> after first selecting the basin and watershed of interest.



## 6.2 Ground Water

The Division of Water Resources' ground water program is responsible for ground water protection strategy development, wellhead protection, and underground injection of waste. The division also conducts an enforcement program which requires water suppliers to meet requirements of the Safe Drinking Water Act with respect to water quality and information reporting. More information, including water withdrawal of ground water, is at: <http://tn.gov/environment/article/wr-wq-water-withdrawal-registration-program>

The Division of Water Resources' ground water program produces a report that describes the status of ground water quality. The most recent report is posted at: <http://tn.gov/environment/topic/wr-wq-dw-drinking-water>

## 6.3 Source Water Assessment

Section 1453 of the 1996 Safe Drinking Water Act (SDWA) Amendments required that all states establish Source Water Assessment Programs (SWAP), and submit a plan to EPA by February 6, 1999 detailing how they would:

- Delineate source water protection areas
- Inventory significant contaminants in these areas
- Determine the susceptibility of each public water supply to contamination

Tennessee's Source Water Assessment Plan was approved in November of 1999. By April of 2003, the source water assessments of the community ground water systems and the source water assessments for the community and non-community surface water systems were completed. Shortly thereafter, they were sent to the public water systems and made available on the TDEC website (<http://tn.gov/environment/article/wr-wq-source-water-assessment>). The source water assessments for the non-community ground water systems have also been completed.

The assessments are intended to enhance the protection of drinking water supplies within existing programs at the federal, state and local levels. Tennessee's SWAP efforts are being used to improve the existing source water protection efforts within Tennessee's Wellhead Protection Program and Watershed Management Program.

Source water protection areas for public water systems using surface water have been based on the portion of the watershed area upstream of the water intake using time of travel (the time it takes for water to travel a given distance) and a 1000-foot corridor on either side of the stream.

All water systems in Tennessee are to update these assessments on a regular basis as required by rule. In 2014 Tennessee updated the reporting requirements in TCA 0400-45-01-.35, requiring assessments to be completed every year with a report to the state every three years. The complete Tennessee Source Water Assessment Report and appendices are found at:

<http://tn.gov/environment/article/wr-wq-source-water-assessment>

Maps illustrating delineated source water protection areas in Tennessee watersheds are found in Appendix C. TDEC continues to delineate all source water protection areas in the state.

## **7.0 CITIZEN INVOLVEMENT**

Through public hearings, meetings, and other types of public information sessions, the public provides input on proposed actions that affect watersheds and potable water quality. There are several opportunities for citizens to be involved:

- **Watershed Events.** Participate in a watershed event hosted by the division or visit a division booth at various events across the state. Information about events are posted on the TDEC calendar, watershed events page and on Face Book

- Comment on proposed Water Quality Standards. Water Quality Standards are updated every three years, following a series of public hearings across the state. Public comments are considered before a final recommendation is made to the Tennessee Board of Water Quality, Oil and Gas for approval. TDEC held a listening session for this on December 15, 2016.
- Comment throughout the year on draft permits during public comment period. Draft permits are placed on public notice and posted at: <http://tn.gov/environment/topic/ppo-water>
- Comment on proposed 303(d) List (list of impaired waters). Meetings are held across the state at convenient locations in order to seek public comment on the draft 303(d) List. Following the meetings, the Division of Water Resources submits the 303(d) List to EPA for approval. This list is compiled every two years. The most recent public meetings were held in 2016.
- Comment on proposed TMDLs that are placed on public notice and posted at: <http://tn.gov/environment/topic/ppo-water> .
- Address the Tennessee Board of Water Quality, Oil and Gas. The Board has traditionally assigned April and October as the months for the public to make comments (oral or written) on any water quality issue. Board meeting schedules and agendas are posted at <http://tn.gov/environment/article/board-tennessee-board-of-water-quality-oil-and-gas> .

The Division of Water Resources has a web site that can be accessed through the TDEC home page (<http://tn.gov/environment/section/wr-water-resources>), which allows the public to navigate through a list of public participation opportunities.

Comments on any issue are welcome at any time and may be made by sending e-mail to [ask.tdec@tn.gov](mailto:ask.tdec@tn.gov).

## 8.0 RECOMMENDATIONS

The 2006 amendment to the Water Quality Control Act requires that recommendations be presented to the Governor and the General Assembly annually. TDEC's recommendations are:

- Public water suppliers are continuing to collect data and report them by submitting paper copies to TDEC. Help should be provided to these water providers so they can report their raw water data electronically which will result in timely analyses of public water supply data, reduce the cost of data transmission, and ease the burden of data storage. Furthermore, TDEC would benefit from having additional technical assistance with building the system to streamline data submittal to EPA.
- Tennessee's infrastructure, including municipal water/wastewater distribution, collection, transport and treatment systems, are critically important to the protection of public health and the environment. Across the state there are numerous aging systems in need of major repair. The costs for this work can be very difficult for these system to bear on their own. Federal support for water and wastewater infrastructure in Tennessee has contributed significantly over the years to water quality improvement, but needs still exceed available funds. The State Revolving Loan Programs are an option for funding water or wastewater infrastructure needs. Tennessee should continue to support the State Revolving Loan Program, as well as take advantage of any new federal programs that become available.
- Continue close communication with Tennessee's congressional delegation on matters involving water resource management, clean water programs, and funding.
- Drought management is essential in Tennessee. For example, the South Cumberland Plateau reached a critical stage this past year, with many utilities having to initiate emergency efforts. The legislature should work with TDEC to fund the implementation plans for regional water supply guidelines and process documents, as well as the "Statewide Analysis of Hydrologic and Water System Information Proposal" created by the governor's Water Resources Technical Advisory Committee.
- Excess nutrient loads in Tennessee waters are becoming a larger threat for human and environmental health. Nutrients come from numerous sources, so multiple stakeholders will need to work together to solve the problem. The legislature should encourage the Department of Agriculture, public universities in the state, and the Tennessee Wildlife Resources Agency to work with TDEC to develop and implement strategies for reducing nutrient loads into impaired streams.

## APPENDIX A – WATER SYSTEMS & THEIR SOURCES

| WATERSHED                   | COUNTY     | SYSTEM                              | SOURCE           | POP SERVED |
|-----------------------------|------------|-------------------------------------|------------------|------------|
| Barren River (05110002)     | Macon      | Lafayette Water System              | Barren River     | 18,045     |
| Barren River (05110002)     | Macon      | Lafayette Water System              | Springs          |            |
| Barren River (05110002)     | Sumner     | Portland Water System               | Drakes Creek     | 20,482     |
| Barren River (05110002)     | Sumner     | Portland Water System               | City Lake        |            |
| Barren River (05110002)     | Macon      | Red Boiling Springs Water System    | Springs          | 5,465      |
| Buffalo River (06040004)    | Perry      | Linden Water Dept                   | Buffalo River    | 6,610      |
| Buffalo River (06040004)    | Perry      | Lobelville Water Dept               | Buffalo River    | 3,090      |
| Buffalo River (06040004)    | Wayne      | Waynesboro Water System             | Green River      | 4,255      |
| Buffalo River (06040004)    | Lewis      | Hohenwald Water System              | Wells            | 9,739      |
| Buffalo River (06040004)    | Lawrence   | Summertown Utility District         | Wells            | 3,770      |
| Caney Fork River (05130108) | White      | Bon De Croft Utility District       | Lake             | 3,765      |
| Caney Fork River (05130108) | Putnam     | Cookeville Water Dept               | Mine Lick Creek  | 44,189     |
| Caney Fork River (05130108) | Cumberland | Crossville Water Dept               | Meadow Lake      | 31,898     |
| Caney Fork River (05130108) | Cumberland | Cumberland Mountain Retreat         | Wells            | 250        |
| Caney Fork River (05130108) | De Kalb    | Dowelltown-Liberty Utility District | Well             | 1,250      |
| Caney Fork River (05130108) | Smith      | Smith Utility District              | Caney Fork River | 7,674      |

**Table A- 1 Water Systems, Their Sources and Population Served**

| WATERSHED                                     | COUNTY    | SYSTEM                             | SOURCE                          | POP SERVED |
|---|-----------|------------------------------------|---------------------------------|------------|
| Caney Fork River (05130108)                   | DeKalb    | Smithville Water System            | Center Hill Lake                | 6,419      |
| Caney Fork River (05130108)                   | White     | Sparta Water System                | Calfkiller River                | 9,352      |
| Caney Fork River (05130108)                   | Van Buren | Spencer Water System               | Laurel Lake<br>Caney Fork River | 5,103      |
| Caney Fork River (05130108)                   | Bledsoe   | BCCX Water System                  | Bee Creek                       | 50         |
| Cheatham Lake (05130202)                      | Cheatham  | Ashland City Water Dept            | Big Marrowbone                  | 7,462      |
| Cheatham Lake (05130202)                      | Davidson  | Harpeth Valley Utility District    | Cumberland River                | 59,392     |
| Cheatham Lake (05130202)                      | Davidson  | Madison Suburban Utility District  | Cumberland River                | 70,391     |
| Cheatham Lake (05130202)                      | Davidson  | Metro Water Services               | Cumberland River                | 637,216    |
| Cheatham Lake (05130202)                      | Cheatham  | Pleasant View Utility District     | Sycamore Creek                  | 16,374     |
| Cheatham Lake (05130202)                      | Cheatham  | River Road Utility District        | Brush Creek                     | 3,440      |
| Clear Fork of the Cumberland River (05130101) | Campbell  | Jellico Water Dept                 | Mine Impoundment                | 4,987      |
| Collins River (05130107)                      | Grundy    | Big Creek Utility District         | Big Creek Lake                  | 7,783      |
| Collins River (05130107)                      | Warren    | McMinnville Water Dept             | Barren Fork River               | 17,312     |
| Collins River (05130107)                      | Warren    | Warren County Utility District     | Collins River                   | 24,003     |
| Collins River (05130107)                      | Warren    | West Warren-Viola Utility District | Hickory Creek                   | 15,823     |
| Conasauga River (03150101)                    | Bradley   | Cleveland Utilities                | Spring                          | 81,348     |
| Conasauga River (03150101)                    | Bradley   | Ocoee Utility District             | Spring                          | 18,745     |
| Cordell Hull Lake (05130106)                  | Jackson   | Gainesboro Water System            | Cumberland River                | 1,492      |
| Cordell Hull Lake (05130106)                  | Overton   | Livingston Water Department        | Roaring River                   | 14,386     |
| Cordell Hull Lake (05130106)                  | Overton   | Livingston Water Department        | City Lake                       |            |

**Table A-1a Water Systems, Their Sources and Population Served**

| WATERSHED                    | COUNTY     | SYSTEM                            | SOURCE                  | POP SERVED |
|------------------------------|------------|-----------------------------------|-------------------------|------------|
| Cordell Hull Lake (05130106) | Clay       | Northwest Clay County Utility     | Cumberland River        | 3,984      |
| Cordell Hull Lake (05130106) | Macon      | Red Boiling Springs Water System  | Springs                 | 5,465      |
| Emory River (06010208)       | Cumberland | Crab Orchard Utility District     | Otter Creek Impoundment | 22,318     |
| Emory River (06010208)       | Cumberland | Crossville Water Department       | Holiday Hills Lake      |            |
| Emory River (06010208)       | Roane      | Harriman Utility Board            | Emory River             | 15,139     |
| Emory River (06010208)       | Roane      | Kingston Water System             | Spring                  | 9,907      |
| Emory River (06010208)       | Morgan     | Plateau Utility District          | Crooked Fork Creek      | 12,477     |
| Emory River (06010208)       | Roane      | Cumberland Utility District       | Emory Fork              | 10,856     |
| Guntersville Lake (06030001) | Marion     | South Pittsburg Water System      | Tennessee River         | 6,520      |
| Guntersville Lake (06030001) | Grundy     | Monteagle Public Utility Board    | Laurel Lake             | 3,150      |
| Guntersville Lake (06030001) | Franklin   | Sewanee Utility District          | Lake Jackson            | 5,493      |
| Guntersville Lake (06030001) | Franklin   | Sewanee Utility District          | Lake Odonnell           |            |
| Guntersville Lake (06030001) | Grundy     | Tracy City Water System           | Big Fiery Gizzard       | 4,458      |
| Harpeth River (05130204)     | Williamson | Franklin Water Department         | Harpeth River           | 63,966     |
| Harpeth River (05130204)     | Williamson | Nolensville-College Grove U.D.    | Well                    | 22,139     |
| Harpeth River (05130204)     | Cheatham   | Second South Cheatham U.D.        | Harpeth River           | 9,148      |
| Harpeth River (05130204)     | Dickson    | Water Authority Of Dickson County | Turnbull Creek          | 53,843     |
| Hatchie River (08010208)     | Tipton     | Munford Water Department          | Wells                   | 9,175      |
| Hatchie River (08010208)     | Tipton     | First U D Of Tipton County        | Wells                   | 8,915      |

**Table A-1b Water Systems, Their Sources and Population Served**

| WATERSHED                 | COUNTY     | SYSTEM                                | SOURCE           | POP SERVED |
|---------------------------|------------|---------------------------------------|------------------|------------|
| Hatchie River (08010208)  | Tipton     | Covington Water Department            | Wells            | 11,580     |
| Hatchie River (08010208)  | Hardeman   | Grand Valley Lakes Owners Association | Well             | 818        |
| Hatchie River (08010208)  | Lauderdale | Henning Water Department              | Well             | 1,236      |
| Hatchie River (08010208)  | Madison    | Jackson Energy Authority              | Mercer Wellfield | 163        |
| Hatchie River (08010208)  | Lauderdale | Ripley Water System                   | Wells            | 9,536      |
| Hatchie River (08010208)  | Hardeman   | Rogers Springs                        | Well             | 135        |
| Hatchie River (08010208)  | Hardeman   | Bolivar Water System                  | Wells            | 5,497      |
| Hatchie River (08010208)  | Haywood    | Brownsville Water Department          | Wells            | 13,621     |
| Hatchie River (08010208)  | Haywood    | Stanton Water System                  | Wells            | 685        |
| Hatchie River (08010208)  | Hardeman   | Toone Water System                    | Wells            | 654        |
| Hatchie River (08010208)  | Lauderdale | West TN State Penitentiary            | Wells            | 3,200      |
| Hatchie River (08010208)  | Hardeman   | Whiteville Water Department           | Wells            | 1,788      |
| Hatchie River (08010208)  | Hardeman   | Middleton Water Department            | Wells            | 706        |
| Hatchie River (08010208)  | Hardeman   | Woodrun Lakes Subdivision             | Wells            | 176        |
| Hatchie River (08010208)  | Lauderdale | Lauderdale County Water System        | Wells            | 10,946     |
| Hiwassee River (06020002) | Monroe     | Tellico Plains Water Department       | Wells            | 5,700      |
| Hiwassee River (06020002) | McMinn     | Athens Utilities Board                | Wells            | 19,740     |
| Hiwassee River (06020002) | McMinn     | Athens Utilities Board                | Spring           |            |
| Hiwassee River (06020002) | Polk       | Benton Water System                   | Well & Spring    | 2,502      |
| Hiwassee River (06020002) | Bradley    | Cleveland Utilities                   | Hiwassee River   | 81,348     |

**Table A-1c Water Systems, Their Sources and Population Served**



| WATERSHED                 | COUNTY    | SYSTEM                              | SOURCE          | POP SERVED |
|---------------------------|-----------|-------------------------------------|-----------------|------------|
| Hiwassee River (06020002) | McMinn    | Englewood Water Department          | Middle Creek    | 3,613      |
| Hiwassee River (06020002) | McMinn    | Etowah Utilities                    | Hiwassee River  | 12,100     |
| Hiwassee River (06020002) | Bradley   | Hiwassee Utility Commission         | Hiwassee River  | 98         |
| Hiwassee River (06020002) | Bradley   | Ocoee Utility District              | Spring          | 18,754     |
| Holston River (06010104)  | Hawkins   | First U D Of Hawkins Co,#1          | Alexander Creek | 18,954     |
| Holston River (06010104)  | Hawkins   | First U D Of Hawkins Co,#1          | Hord Creek      |            |
| Holston River (06010104)  | Hawkins   | First U D Of Hawkins Co,#2          | Wells           |            |
| Holston River (06010104)  | Grainger  | Hopper's Bluff Subdivision          | Wells           | 25         |
| Holston River (06010104)  | Jefferson | Jefferson City Water & Sewer        | Mossy Creek     | 8,938      |
| Holston River (06010104)  | Jefferson | Jefferson City Water & Sewer        | Mine            |            |
| Holston River (06010104)  | Hawkins   | Lakeview Utility District           | Wells           | 3,830      |
| Holston River (06010104)  | Hawkins   | Mid-Hawkins County Utility District | Wells           | 630        |
| Holston River (06010104)  | Hawkins   | Mooreburg Utility District          | Spring          | 1,179      |
| Holston River (06010104)  | Hamblen   | Morristown Water System             | Springs         | 34,109     |
| Holston River (06010104)  | Hamblen   | Morristown Water System             | Holston River   |            |
| Holston River (06010104)  | Knox      | Northeast Knox Utility District     | Holston River   | 22,887     |
| Holston River (06010104)  | Hawkins   | Persia Utility District             | Wells           | 4,483      |
| Holston River (06010104)  | Hawkins   | Rogersville Water System            | Wells           | 11,183     |
| Holston River (06010104)  | Hawkins   | Rogersville Water System            | Big Creek       |            |
| Holston River (06010104)  | Hawkins   | Surgoinsville Utility District      | Spring          | 2,372      |

**Table A-1d Water Systems, Their Sources and Population Served**

| WATERSHED                         | COUNTY     | SYSTEM                                     | SOURCE           | POP SERVED |
|-----------------------------------|------------|--|------------------|------------|
| Holston River (06010104)          | Union      | Luttrell-Blaine-Corryton Utility District  | Springs          | 8835       |
| Lake Barkley (05130205)           | Montgomery | Clarksville Water Department               | Cumberland River | 195147     |
| Lake Barkley (05130205)           | Montgomery | Cunningham East Montgomery UD              | Cumberland River | 25         |
| Lake Barkley (05130205)           | Stewart    | Dover Water Department                     | Cumberland River | 4011       |
| Lake Barkley (05130205)           | Montgomery | Erin Water Treatment Plant                 | Cumberland River | 7001       |
| Lake Barkley (05130205)           | Stewart    | Hidden Hollow Water System                 | Wells            | 79         |
| Lake Barkley (05130205)           | Stewart    | Loon Bay Property Owners Association       | Wells            | 134        |
| Lake Barkley (05130205)           | Stewart    | North Stewart Utility District             | Wells            | 5400       |
| Lake Barkley (05130205)           | Stewart    | North Stewart Utility District             | Spring Lake      |            |
| Lake Barkley (05130205)           | Dickson    | Water Authority Of Dickson County          | Cumberland River |            |
| Lake Barkley (05130205)           | Dickson    | Vanleer Water System                       | Springs          | 2824       |
| Lake Barkley (05130205)           | Williamson | Nolensville-College Grove Utility District | Wells            | 22139      |
| Little Hatchie River (08010207)   | Mcnaury    | Bethel Springs Water System                | Wells            | 932        |
| Little Hatchie River (08010207)   | Mcnaury    | Ramer Water Department                     | Wells            | 512        |
| Little Hatchie River (08010207)   | Mcnaury    | Selmer Water System                        | Wells            | 18950      |
| Little Hatchie River (08010207)   | Hardeman   | Middleton Water Department                 | Wells            | 706        |
| Little Tennessee River (06010204) | Blount     | South Blount                               | Little TN River  | 41187      |
| Little Tennessee River (06010204) | Monroe     | Hiwassee College                           | Spring           | 250        |
| Little Tennessee River (06010204) | Monroe     | Laurel Mtn Lakes Water Association         | Wells            | 254        |
| Little Tennessee River (06010204) | Monroe     | Tellico Area Services System               | Little TN River  | 11822      |
| Little Tennessee River (06010204) | Monroe     | Tellico Plains Water Department            | Wells            | 5700       |

**Table A-1e Water Systems, Their Sources and Population Served**

| WATERSHED                         | COUNTY   | SYSTEM                            | SOURCE          | POP SERVED |
|-----------------------------------|----------|-----------------------------------|-----------------|------------|
| Little Tennessee River (06010204) | Loudon   | Loudon Utilities Board            | Spring          | 12444      |
| Loosahatchie River (08010209)     | Tipton   | Mason Water Department            | Wells           | 2773       |
| Loosahatchie River (08010209)     | Shelby   | Millington Water Department       | Wells           | 8337       |
| Loosahatchie River (08010209)     | Shelby   | Memphis Light Gas & Water         | Long Station    |            |
| Loosahatchie River (08010209)     | Shelby   | Memphis Light Gas & Water         | Morton Station  |            |
| Loosahatchie River (08010209)     | Shelby   | Memphis Light Gas & Water         | Arlington Wells |            |
| Loosahatchie River (08010209)     | Shelby   | NSA – Midsouth                    | Wells           | 6300       |
| Loosahatchie River (08010209)     | Fayette  | Oakland Water Department          | Well            | 10728      |
| Loosahatchie River (08010209)     | Tipton   | Poplar Grove Utility District     | Wells           | 17546      |
| Loosahatchie River (08010209)     | Fayette  | Somerville Water System           | Wells           | 5263       |
| Loosahatchie River (08010209)     | Tipton   | Munford Water Department          | Wells           | 9175       |
| Lower Clinch River (06010207)     | Anderson | Anderson County Water Authority   | Clinch River    | 25404      |
| Lower Clinch River (06010207)     | Anderson | Clinton Utility Board             | Clinch River    | 18288      |
| Lower Clinch River (06010207)     | Knox     | Hallsdale Powell Utility District | Bullrun Creek   | 72822      |
| Lower Clinch River (06010207)     | Knox     | Hallsdale Powell Utility District | Beaver Creek    |            |
| Lower Clinch River (06010207)     | Knox     | Hallsdale Powell Utility District | Spring          |            |
| Lower Clinch River (06010207)     | Anderson | Norris Water Commission           | Spring          | 1985       |
| Lower Clinch River (06010207)     | Anderson | Anderson County Utility Board     | Clinch River    | 10446      |
| Lower Clinch River (06010207)     | Anderson | Oak Ridge Dept Of Public Works    | Clinch River    | 36842      |

**Table A-1f Water Systems, Their Sources and Population Served**

| WATERSHED                                 | COUNTY    | SYSTEM   | SOURCE           | POP SERVED |
|---|-----------|--|------------------|------------|
| Lower Clinch River<br>(06010207)          | Roane     | Oliver Springs<br>Water Board                    | Spring           | 5116       |
| Lower Clinch River<br>(06010207)          | Knox      | West Knox Utility<br>District                    | Melton Hill Lake | 62812      |
| Lower Clinch River<br>(06010207)          | Knox      | West Knox Utility<br>District                    | Melton Hill Lake |            |
| Lower Clinch River<br>(06010207)          | Union     | Maynardville Water<br>Dept                       | Springs          | 7135       |
| Lower Clinch River<br>(06010207)          | Union     | Luttrell-Blaine-<br>Corryton Utility<br>District | Springs          | 8835       |
| Lower Duck River<br>(06040003)            | Hickman   | Centerville Water<br>System                      | Big Swan Creek   | 9353       |
| Lower Duck River<br>(06040003)            | Hickman   | Bon Aqua-Lyles<br>Utility District               | Piney River      | 9746       |
| Lower Duck River<br>(06040003)            | Maury     | Columbia Water<br>Department                     | Duck River       | 59953      |
| Lower Duck River<br>(06040003)            | Maury     | Mount Pleasant<br>Water System #1                | Springs          | 7470       |
| Lower Duck River<br>(06040003)            | Lewis     | The Farm Water<br>System                         | Wells            | 180        |
| Lower Duck River<br>(06040003)            | Hickman   | Turney Center                                    | Duck River       | 1936       |
| Lower Duck River<br>(06040003)            | Dickson   | Water Authority Of<br>Dickson County             | W. Piney River   |            |
| Lower Duck River<br>(06040003)            | Humphreys | Waverly Water<br>System                          | Duck River       | 8344       |
| Lower Duck River<br>(06040003)            | Maury     | Spring Hill                                      | Duck River       | 37166      |
| Lower Duck River<br>(06040003)            | Lewis     | Hohenwald Water<br>System                        | Wells            | 9739       |
| Lower Duck River<br>(06040003)            | Lawrence  | Summertown Utility<br>District                   | Wells            | 3770       |
| Lower Elk River<br>(06030003)             | Lawrence  | Leoma Utility<br>District                        | Wells And Spring | 3290       |
| Lower Elk River<br>(06030003)             | Giles     | Pulaski Water<br>System                          | Richland Creek   | 10685      |
| Lower French<br>Broad River<br>(06010107) | Sevier    | Chalet Village North                             | Wells            | 1458       |

**Table A-1g Water Systems, Their Sources and Population Served**

| WATERSHED                           | COUNTY    | SYSTEM                                     | SOURCE              | POP SERVED |
|-------------------------------------|-----------|--|---------------------|------------|
| Lower French Broad River (06010107) | Sevier    | Cove Mountain Mobile Home Park             | Wells               | 93         |
| Lower French Broad River (06010107) | Sevier    | East Sevier County Utility District        | Wells               | 848        |
| Lower French Broad River (06010107) | Sevier    | Gatlinburg Water Department                | Little Pigeon River | 9731       |
| Lower French Broad River (06010107) | Sevier    | Great Smoky Mountains National Park        | Well                | 3125       |
| Lower French Broad River (06010107) | Knox      | Knox-Chapman Utility District              | French Broad        | 32947      |
| Lower French Broad River (06010107) | Sevier    | Norton Creek Water System                  | Well                | 107        |
| Lower French Broad River (06010107) | Sevier    | Pigeon Forge                               | Douglas Lake        | 12936      |
| Lower French Broad River (06010107) | Sevier    | Pigeon Forge                               | Walden's Creek      |            |
| Lower French Broad River (06010107) | Sevier    | Riverside Campground                       | Wells               | 59         |
| Lower French Broad River (06010107) | Sevier    | Sevierville Water System                   | Little Pigeon River | 30419      |
| Lower French Broad River (06010107) | Jefferson | White Pine Water System                    | Wells               | 3688       |
| Lower Tennessee River (06020001)    | Rhea      | Dayton Water Dept                          | Tennessee River     | 22698      |
| Lower Tennessee River (06020001)    | Hamilton  | Eastside Utility District                  | Chickamauga Lake    | 50253      |
| Lower Tennessee River (06020001)    | Hamilton  | Soddy-Daisy-Falling Water Utility District | Soddy Ck Embayment  | 10208      |
| Lower Tennessee River (06020001)    | Hamilton  | Tennessee-American Water Company           | Tennessee River     | 195491     |

**Table A-1h Water Systems, Their Sources and Population Served**

| WATERSHED                        | COUNTY     | SYSTEM                                     | SOURCE           | POP SERVED |
|----------------------------------|------------|--|------------------|------------|
| Lower Tennessee River (06020001) | Meigs      | Decatur Water Department                   | Spring           | 5680       |
| Lower Tennessee River (06020001) | Rhea       | Graysville Water Department                | Well             | 1878       |
| Lower Tennessee River (06020001) | Rhea       | Laurelbrook Sanitarium-School              | Wells            | 150        |
| Lower Tennessee River (06020001) | Hamilton   | Savannah Valley Utility District           | Wells & Spring   | 22454      |
| Lower Tennessee River (06020001) | Hamilton   | Soddy-Daisy-Falling Water Utility District | Wells            |            |
| Lower Tennessee River (06020001) | Hamilton   | Union Fork-Bakewell Utility District       | Wells            | 4767       |
| Lower Tennessee River (06020001) | Marion     | River Landing Development                  | Wells            | 52         |
| Lower Tennessee River (06020001) | Marion     | Suck Creek Utility District                | Wells            | 610        |
| Lower Tennessee River (06020001) | Hamilton   | Hixson Utility District                    | Wells            | 58420      |
| Mississippi River (08010100)     | Lake       | Ridgely Water System                       | Wells            | 1833       |
| Mississippi River (08010100)     | Lake       | Tiptonville Water System                   | Wells            | 2369       |
| Mississippi River (08010100)     | Lauderdale | Lauderdale Co Water System                 | Wells            | 10946      |
| Nolichucky River (06010108)      | Jefferson  | White Pine Water System                    | Wells            | 3688       |
| Nolichucky River (06010108)      | Greene     | Greeneville Water & Light                  | Nolichucky River | 26890      |
| Nolichucky River (06010108)      | Washington | Johnson City Water Department              | Spring           | 105820     |
| Nolichucky River (06010108)      | Washington | Jonesborough Water Department              | Nolichucky River | 24036      |
| Nolichucky River (06010108)      | Greene     | North Greene Utility District              | Lick Creek       | 4923       |
| Nolichucky River (06010108)      | Unicoi     | Erwin Utilities                            | Wells            | 7001       |
| Nonconnah Creek (08010211)       | Shelby     | Memphis Light Gas & Water                  | Davis Station    |            |

**Table A-1i Water Systems, Their Sources and Population Served**

| WATERSHED                         | COUNTY   | SYSTEM                                | SOURCE                 | POP SERVED |
|-----------------------------------|----------|---------------------------------------|------------------------|------------|
| Nonconnah Creek (08010211)        | Shelby   | Memphis Light Gas & Water             | Allen Station          |            |
| Nonconnah Creek (08010211)        | Shelby   | Memphis Light Gas & Water             | Palmer Station         |            |
| Nonconnah Creek (08010211)        | Shelby   | Memphis Light Gas & Water             | Litchtermann Station   |            |
| Nonconnah Creek (08010211)        | Shelby   | Memphis Light Gas & Water             | Sheahan Station        |            |
| North Fork Forked Deer (08010204) | Crockett | Alamo Water Department                | Wells                  | 3316       |
| North Fork Forked Deer (08010204) | Crockett | County Wide Utility District          | No.3 Bonicord - Wells  | 8453       |
| North Fork Forked Deer (08010204) | Crockett | County Wide Utility District          | No.2 Salem - Wells     |            |
| North Fork Forked Deer (08010204) | Crockett | County Wide Utility District          | No.6 Gadsden - Wells   |            |
| North Fork Forked Deer (08010204) | Crockett | County Wide Utility District          | No.5b Hwy 412-Wells    |            |
| North Fork Forked Deer (08010204) | Crockett | Crockett Mills Utility District       | Wells                  | 793        |
| North Fork Forked Deer (08010204) | Gibson   | Dyer Water Department                 | Wells                  | 2394       |
| North Fork Forked Deer (08010204) | Dyer     | Dyersburg Sub Cons Utility District   | Well                   | 3752       |
| North Fork Forked Deer (08010204) | Dyer     | Dyersburg Water Department            | Wells                  | 19986      |
| North Fork Forked Deer (08010204) | Crockett | Friendship Water Company              | Well                   | 923        |
| North Fork Forked Deer (08010204) | Gibson   | Gibson Co Municipal Water District #1 | Grier's Chapel - Wells | 2832       |
| North Fork Forked Deer (08010204) | Gibson   | Gibson County Municipal Water Dist #3 | Wells                  | 1449       |
| North Fork Forked Deer (08010204) | Gibson   | Gibson County Municipal Water Dist #4 | Fruitland Well         | 3342       |
| North Fork Forked Deer (08010204) | Gibson   | Gibson Co Municipal Water District #5 | Wells                  | 1620       |
| North Fork Forked Deer (08010204) | Gibson   | Gibson Water Department               | Well                   | 464        |

**Table A-1j Water Systems, Their Sources and Population Served**

| WATERSHED                          | COUNTY   | SYSTEM                               | SOURCE                 | POP SERVED |
|------------------------------------|----------|--------------------------------------|------------------------|------------|
| North Fork Forked Deer (08010204)  | Gibson   | Humbolt Utilities-Water Department   | Wells                  | 10243      |
| North Fork Forked Deer (08010204)  | Crockett | Maury City Water Department          | Wells                  | 1099       |
| North Fork Forked Deer (08010204)  | Gibson   | Milan Water Department               | Wells                  | 10298      |
| North Fork Forked Deer (08010204)  | Dyer     | Newbern Water Department             | Wells                  | 8568       |
| North Fork Forked Deer (08010204)  | Dyer     | Northwest Dyersburg Utility District | Well                   | 4062       |
| North Fork Forked Deer (08010204)  | Gibson   | Trenton Water System                 | Wells                  | 5295       |
| North Fork Forked Deer (08010204)  | Crockett | County Wide Utility District         | No.4 Old Field – Wells |            |
| North Fork Forked Deer (08010204)  | Crockett | County Wide Utility District         | No.1 Gum Flat – Wells  |            |
| North Fork Forked Deer (08010204)  | Madison  | Jackson Energy Authority             | Wellfields.            |            |
| Obey River (05130105)              | Pickett  | Byrdstown Water Department           | Obey River             | 7785       |
| Obey River (05130105)              | Clay     | Celina Water System                  | Obey River             | 4650       |
| Obey River (05130105)              | Putnam   | Heritage Academy                     | Well                   | 100        |
| Obey River (05130105)              | Putnam   | Monterey Water Department            | City Lake              | 4493       |
| Obey River (05130105)              | Putnam   | Monterey Water Department            | Meadow Creek Lake      |            |
| Obion River, North Fork (08010202) | Obion    | Elbridge Water Association           | Wells                  | 3106       |
| Obion River, North Fork (08010202) | Obion    | Mason Hall Development Corp.         | Wells                  | 219        |
| Obion River, North Fork (08010202) | Obion    | Obion Water Dept                     | Wells                  | 1631       |
| Obion River, North Fork (08010202) | Lake     | Reelfoot Utility District            | Well                   | 651        |
| Obion River, North Fork (08010202) | Obion    | South Fulton Water System            | Wells                  | 3975       |
| Obion River, North Fork (08010202) | Dyer     | Trimble Water System                 | Wells                  | 806        |

**Table A-1k Water Systems, Their Sources and Population Served**



| WATERSHED                          | COUNTY  | SYSTEM                          | SOURCE | POP SERVED |
|------------------------------------|---------|---------------------------------|--------|------------|
| Obion River, North Fork (08010202) | Obion   | Troy Water System               | Wells  | 2172       |
| Obion River, North Fork (08010202) | Obion   | Union City Water Dept           | Wells  | 16000      |
| Obion River, North Fork (08010202) | Henry   | Puryear Water System            | Well   | 833        |
| Obion River, South Fork (08010203) | Carroll | Atwood Water System             | Wells  | 1325       |
| Obion River, South Fork (08010203) | Gibson  | Bradford Water System           | Wells  | 1285       |
| Obion River, South Fork (08010203) | Carroll | Cedar Grove Utility District    | Wells  | 1340       |
| Obion River, South Fork (08010203) | Gibson  | County Line Trailer Park        | Wells  | 76         |
| Obion River, South Fork (08010203) | Weakley | Dresden Water Department        | Wells  | 3860       |
| Obion River, South Fork (08010203) | Weakley | Gleason Water Department        | Wells  | 1679       |
| Obion River, South Fork (08010203) | Weakley | Greenfield Water Department     | Wells  | 2445       |
| Obion River, South Fork (08010203) | Henry   | Henry Water System              | Well   | 595        |
| Obion River, South Fork (08010203) | Carroll | Huntingdon Water Department     | Wells  | 6243       |
| Obion River, South Fork (08010203) | Obion   | Kenton Water Department         | Wells  | 1424       |
| Obion River, South Fork (08010203) | Weakley | Martin Water Department         | Wells  | 11359      |
| Obion River, South Fork (08010203) | Carroll | McKenzie Water Department       | Wells  | 5836       |
| Obion River, South Fork (08010203) | Carroll | McLemoresville Water Department | Wells  | 399        |
| Obion River, South Fork (08010203) | Gibson  | Rutherford Water System         | Wells  | 1393       |
| Obion River, South Fork (08010203) | Weakley | Sharon Water System             | Wells  | 1329       |

**Table A-11 Water Systems, Their Sources and Population Served**

| WATERSHED                          | COUNTY    | SYSTEM                           | SOURCE             | POP SERVED |
|------------------------------------|-----------|----------------------------------|--------------------|------------|
| Obion River, South Fork (08010203) | Carroll   | Trezevant Water System           | Wells              | 992        |
| Ocoee River (06020003)             | Polk      | Cherokee Hills Utility District  | Springs            | 288        |
| Ocoee River (06020003)             | Polk      | Copper Basin Utility District    | Campbell Cove Lake | 3099       |
| Old Hickory Lake (05130201)        | Sumner    | Gallatin Water Department        | Cumberland River   | 43513      |
| Old Hickory Lake (05130201)        | Wilson    | West Wilson Utility District     | Old Hickory Lake   | 63499      |
| Old Hickory Lake (05130201)        | Sumner    | White House Utility District     | Old Hickory Lake   | 91761      |
| Old Hickory Lake (05130201)        | Smith     | Carthage Water System            | Cumberland River   | 2965       |
| Old Hickory Lake (05130201)        | Trousdale | Hartsville Water Department      | Cumberland River   | 9036       |
| Old Hickory Lake (05130201)        | Sumner    | Hendersonville Utility District  | Cumberland River   | 52531      |
| Old Hickory Lake (05130201)        | Wilson    | Lebanon Water System             | Cumberland River   | 34134      |
| Old Hickory Lake (05130201)        | Wilson    | Watertown Water System           | Wells              | 1889       |
| Pickwick Lake (06030005)           | Hardin    | First U.D. Of Hardin County      | Tennessee River    | 6647       |
| Pickwick Lake (06030005)           | Lawrence  | Lawrenceburg Water System        | Spring             | 19257      |
| Pickwick Lake (06030005)           | Lawrence  | Lawrenceburg Water System        | Shoal Creek        |            |
| Pickwick Lake (06030005)           | Lawrence  | Loretto Water Department         | Springs            | 3845       |
| Powell River (06010206)            | Claiborne | Arthur-Shawnee Utility District  | Powell River       | 9869       |
| Powell River (06010206)            | Campbell  | Deerfield Resort Water System #1 | Wells              | 1083       |
| Powell River (06010206)            | Claiborne | Lincoln Memorial University      | Spring             | 2200       |
| Red River (05130206)               | Robertson | Adams-Cedar Hill Water System    | Red River          | 5422       |

**Table A-1m Water Systems, Their Sources and Population Served**

| WATERSHED                         | COUNTY     | SYSTEM                        | SOURCE                 | POP SERVED |
|-----------------------------------|------------|-------------------------------|------------------------|------------|
| Red River (05130206)              | Montgomery | Fort Campbell Water System    | Spring                 | 40192      |
| Red River (05130206)              | Montgomery | Fort Campbell Water System    | Red River              |            |
| Red River (05130206)              | Robertson  | Springfield Water System      | Red River              | 38472      |
| Sequatchie River (06020004)       | Marion     | Suck Creek Utility District   | Wells                  | 610        |
| Sequatchie River (06020004)       | Sequatchie | Dunlap Water System           | Sequatchie River       | 7040       |
| Sequatchie River (06020004)       | Marion     | Jasper Water Department       | Spring                 | 9345       |
| Sequatchie River (06020004)       | Marion     | Jasper Water Department       | Sequatchie River       |            |
| Sequatchie River (06020004)       | Bledsoe    | Pikeville Water System        | Wells                  | 4439       |
| South Fork Cumberland (05130104)  | Scott      | Huntsville Utility District   | Flat Creek             | 12877      |
| South Fork Cumberland (05130104)  | Scott      | Huntsville Utility District   | New River              |            |
| South Fork Cumberland (05130104)  | Fentress   | Jamestown Water Department    | North White Oak Ck     | 3494       |
| South Fork Cumberland (05130104)  | Scott      | Oneida W&S                    | City Park Lake         | 11233      |
| South Fork Cumberland (05130104)  | Scott      | Oneida W&S                    | Howard Baker Lake      |            |
| South Fork Forked Deer (08010205) | Crockett   | County Wide Utility District  | No.1 Gum Flat – Wells  |            |
| South Fork Forked Deer (08010205) | Madison    | Jackson Energy Authority      | Wellfields             |            |
| South Fork Forked Deer (08010205) | Crockett   | Bells Public Utility District | Wells                  | 2456       |
| South Fork Forked Deer (08010205) | Crockett   | County Wide Utility District  | No.5a Egg Hill – Wells |            |
| South Fork Forked Deer (08010205) | Lauderdale | Gates Water Department        | Well                   | 892        |

**Table A-1n Water Systems, Their Sources and Population Served**

| WATERSHED                           | COUNTY     | SYSTEM                              | SOURCE                | POP SERVED |
|-------------------------------------|------------|-------------------------------------|-----------------------|------------|
| South Fork Forked Deer (08010205)   | Lauderdale | Halls Water System                  | Wells                 | 5530       |
| South Fork Forked Deer (08010205)   | Chester    | Henderson Water Department          | Wells                 | 8722       |
| South Fork Forked Deer (08010205)   | Madison    | Whispering Pines Trailer Court      | Wells                 | 126        |
| South Fork Holston River (06010201) | Sullivan   | Bloomingtondale Utility District    | Reedy Creek           | 13215      |
| South Fork Holston River (06010201) | Sullivan   | Bluff City Water Department         | Underwood Spring      | 2496       |
| South Fork Holston River (06010201) | Sullivan   | Bristol Dept. Utilities             | S. Fork Holston R.    | 33583      |
| South Fork Holston River (06010201) | Sullivan   | Bristol-Bluff City Utility District | S. Fork Holston R.    | 5479       |
| South Fork Holston River (06010201) | Sullivan   | Jacobs Creek Job Corps              | Little Jacob Creek    | 300        |
| South Fork Holston River (06010201) | Sullivan   | Kingsport Water Department          | South Holston River   | 100577     |
| South Fork Holston River (06010201) | Sullivan   | Bristol-Bluff City Utility District | S. Fork Holston R.    | 5475       |
| South Fork Holston River (06010201) | Johnson    | Mountain City Water Department.     | Silver Lake & Springs | 10291      |
| Stones River (05130203)             | Rutherford | Consolidated U.D. #1, Rutherford    | J. Percy Priest Lake  | 152211     |
| Stones River (05130203)             | Wilson     | Gladeville Utility District #1      | Well                  | 18577      |
| Stones River (05130203)             | Rutherford | La Vergne Water System              | J. Percy Priest Lake  | 34139      |
| Stones River (05130203)             | Rutherford | Murfreesboro Water Department       | E Fork Stones River   | 100188     |
| Stones River (05130203)             | Rutherford | Smyrna Water System                 | J Percy Priest Lake   | 45673      |
| Stones River (05130203)             | Cannon     | Woodbury Water System               | E Fork Stones River   | 9039       |

**Table A-1o Water Systems, Their Sources and Population Served**

| WATERSHED  | COUNTY    | SYSTEM  | SOURCE          | POP SERVED |
|--|-----------|---|-----------------|------------|
| Stones River<br>(05130203)                         | Cannon    | Woodbury Water<br>System                              | Spring          |            |
| TN Western Valley –<br>Beech (06040001)            | Wayne     | Clifton Water<br>Department                           | Tennessee River | 3996       |
| TN Western Valley –<br>Beech (06040001)            | Wayne     | Collinwood Water<br>Department                        | 1 Well          | 1854       |
| TN Western Valley –<br>Beech (06040001)            | Benton    | Dry Branch Water<br>System                            | Wells           | 59         |
| TN Western Valley –<br>Beech (06040001)            | Hardin    | Harbert Hills<br>Academy N.H.                         | Wells           | 12         |
| TN Western Valley –<br>Beech (06040001)            | Henderson | Lexington Water<br>Systems                            | Beech Lake      | 23998      |
| TN Western Valley –<br>Beech (06040001)            | McNairy   | Michie Water<br>Department                            | Wells           | 2609       |
| TN Western Valley –<br>Beech (06040001)            | Decatur   | North Utility District<br>of Decatur/Benton<br>County | Tennessee River | 3493       |
| TN Western Valley –<br>Beech (06040001)            | Decatur   | Parsons Water<br>Department                           | Beech River     | 3977       |
| TN Western Valley –<br>Beech (06040001)            | Hardin    | Saltillo Utility<br>District                          | Wells           | 1904       |
| TN Western Valley –<br>Beech (06040001)            | Henderson | Sardis Water<br>System                                | Well            | 1071       |
| TN Western Valley –<br>Beech (06040001)            | Hardin    | Savannah Utility<br>Department                        | Wells           | 18358      |
| TN Western Valley –<br>Beech (06040001)            | Henderson | Scotts Hill Water<br>System                           | Wells           | 4301       |
| TN Western Valley –<br>Beech (06040001)            | Decatur   | Woodlawn Shores<br>Waterworks                         | Wells           | 62         |
| TN Western Valley –<br>Beech (06040001)            | McNairy   | Adamsville Water<br>System                            | Wells           | 8731       |
| TN Western Valley –<br>Beech (06040001)            | Decatur   | Decaturville Water<br>System                          | Wells           | 2211       |
| TN Western Valley –<br>Kentucky Lake<br>(06040005) | Benton    | Big Sandy Water<br>Department                         | Wells           | 1105       |
| TN Western Valley –<br>Kentucky Lake<br>(06040005) | Carroll   | Bruceton Water<br>System                              | Wells           | 1593       |

**Table A-1p Water Systems, Their Sources and Population Served**

| WATERSHED                                    | COUNTY    | SYSTEM                          | SOURCE          | POP SERVED |
|--|-----------|---------------------------------|-----------------|------------|
| TN Western Valley – Kentucky Lake (06040005) | Benton    | Camden Water Department         | Tennessee River | 9544       |
| TN Western Valley – Kentucky Lake (06040005) | Carroll   | Clarksburg Utility District     | Wells           | 1439       |
| TN Western Valley – Kentucky Lake (06040005) | Henry     | Country Junction                | Wells           | 13         |
| TN Western Valley – Kentucky Lake (06040005) | Stewart   | Doalnara Restoration Society    | Wells           | 148        |
| TN Western Valley – Kentucky Lake (06040005) | Benton    | Harbor Utility District         | Well            | 688        |
| TN Western Valley – Kentucky Lake (06040005) | Carroll   | Hollow Rock Water Dept          | Wells           | 931        |
| TN Western Valley – Kentucky Lake (06040005) | Humphreys | McEwen Water Department         | Wells           | 2911       |
| TN Western Valley – Kentucky Lake (06040005) | Humphreys | New Johnsonville Water Dept     | Tennessee River | 2358       |
| TN Western Valley – Kentucky Lake (06040005) | Henry     | North East Henry County U.D.    | Wells           | 4864       |
| TN Western Valley – Kentucky Lake (06040005) | Henry     | Paris Board Of Public Utilities | Wells           | 12100      |
| TN Western Valley – Kentucky Lake (06040005) | Houston   | Tennessee Ridge Water System    | Wells           | 3493       |
| TN Western Valley – Kentucky Lake (06040005) | Humphreys | Waverly Water System            | Wells           | 8344       |
| TN Western Valley – Kentucky Lake (06040005) | Henry     | Puryear Water System            | Well            | 833        |

**Table A-1q Water Systems, Their Sources and Population Served**

| WATERSHED                         | COUNTY    | SYSTEM                            | SOURCE             | POP SERVED |
|-----------------------------------|-----------|-----------------------------------|--------------------|------------|
| Upper Clinch River (06010205)     | Campbell  | Caryville-Jacksboro U.D.          | Cove Lake          | 10826      |
| Upper Clinch River (06010205)     | Campbell  | Caryville-Jacksboro U.D.          | Well               |            |
| Upper Clinch River (06010205)     | Claiborne | Claiborne County Utility District | Norris Lake        | 15929      |
| Upper Clinch River (06010205)     | Campbell  | La Follette Water Department      | Norris Lake        | 26246      |
| Upper Clinch River (06010205)     | Hancock   | Sneedville Utility District       | Brier Creek        | 2133       |
| Upper Clinch River (06010205)     | Hancock   | Sneedville Utility District       | Clinch River       |            |
| Upper Clinch River (06010205)     | Union     | Maynardville Water Department     | Springs            | 7135       |
| Upper Cumberland River (05130103) | Claiborne | Clear Fork Utility District       | Wells              | 1639       |
| Upper Duck River (06040002)       | Bedford   | Bedford County Utility District   | Duck River         | 18531      |
| Upper Duck River (06040002)       | Marshall  | Chapel Hill Water System          | Well               | 1852       |
| Upper Duck River (06040002)       | Coffee    | Duck River Utility Commission     | Normandy Lake      | 25         |
| Upper Duck River (06040002)       | Marshall  | Lewisburg Water System            | Duck River         |            |
| Upper Duck River (06040002)       | Bedford   | Shelbyville Water System          | Duck River         | 27660      |
| Upper Duck River (06040002)       | Coffee    | Stacey Ann's Mobile Home Park     | Wells              | 141        |
| Upper Duck River (06040002)       | Marshall  | Lewisburg Water System            | Duck River         |            |
| Upper Elk River (06030003)        | Franklin  | Belvidere Rural Utility District  | Wells              | 1446       |
| Upper Elk River (06030003)        | Franklin  | Center Grove-Winchester Springs   | Winchester Springs | 6044       |
| Upper Elk River (06030003)        | Franklin  | Cowan Board Of Public Utilities   | Spring             | 2450       |

**Table A-1r Water Systems, Their Sources and Population Served**

| WATERSHED                           | COUNTY     | SYSTEM                          | SOURCE             | POP SERVED |
|-------------------------------------|------------|---------------------------------|--------------------|------------|
| Upper Elk River (06030003)          | Franklin   | Decherd Water Department        | Wells              | 4321       |
| Upper Elk River (06030003)          | Franklin   | Estill Springs Water Department | Spring             | 4114       |
| Upper Elk River (06030003)          | Lincoln    | Fayetteville Water System       | Spring             | 12390      |
| Upper Elk River (06030003)          | Lincoln    | Fayetteville Water System       | Elk River          |            |
| Upper Elk River (06030003)          | Franklin   | Huntland Water System           | Wells              | 1531       |
| Upper Elk River (06030003)          | Moore      | Metro Lynchburg Moore Co UD     | Tims Ford Lake     | 5223       |
| Upper Elk River (06030003)          | Moore      | Metro Lynchburg Moore Co UD     | Mulberry Creek     |            |
| Upper Elk River (06030003)          | Franklin   | Winchester Water System         | Tims Ford Lake     | 20137      |
| Upper French Broad River (06010105) | Cocke      | Newport Utilities Board         | French Broad       | 29542      |
| Watauga River (06010103)            | Unicoi     | Erwin Utilities                 | Wells              | 12630      |
| Watauga River (06010103)            | Johnson    | Mountain City Water Dept.       | Silver Lake & Spgs | 10269      |
| Watauga River (06010103)            | Johnson    | Brownlow Utility District       | Vaught Creek       | 450        |
| Watauga River (06010103)            | Johnson    | Carderview Utility District     | Wells              | 1062       |
| Watauga River (06010103)            | Johnson    | Cold Springs Utility District   | Spring             | 851        |
| Watauga River (06010103)            | Carter     | Elizabethton Water Dept         | Springs            | 29390      |
| Watauga River (06010103)            | Carter     | First U D Of Carter County      | Wells              | 9222       |
| Watauga River (06010103)            | Carter     | Hampton Utility District        | Spring             | 3986       |
| Watauga River (06010103)            | Washington | Johnson City Water Dept         | Watauga River      | 105826     |
| Watauga River (06010103)            | Carter     | Peter's Hollow Water System     | Wells              | 140        |
| Watauga River (06010103)            | Carter     | Roan Mountain Utility District  | Wells              | 1100       |

**Table A-1r Water Systems, Their Sources and Population Served**



| WATERSHED                                 | COUNTY | SYSTEM  | SOURCE                  | POP SERVED |
|---|--------|---|-------------------------|------------|
| Watts Bar Lake/Ft Loudoun Lake (06010201) | Blount | Alcoa Water System                            | Little River            | 26005      |
| Watts Bar Lake/Ft Loudoun Lake (06010201) | Blount | Allen Dale Drive Mobile Home Park             | Wells                   | 88         |
| Watts Bar Lake/Ft Loudoun Lake (06010201) | Blount | Bays Mountain Mobile Homes                    | Spring                  | 90         |
| Watts Bar Lake/Ft Loudoun Lake (06010201) | Knox   | 1st Utility District of Knox County           | Sinking Creek Embayment | 896593     |
| Watts Bar Lake/Ft Loudoun Lake (06010201) | Roane  | Kingston Water System                         | Tennessee River         | 9907       |
| Watts Bar Lake/Ft Loudoun Lake (06010201) | Knox   | Knoxville U.D.#1 Whitaker Plant               | Tennessee River         | 235131     |
| Watts Bar Lake/Ft Loudoun Lake (06010201) | Loudon | Lenoir City Utility Board                     | Spring                  |            |
| Watts Bar Lake/Ft Loudoun Lake (06010201) | Loudon | Lenoir City Utility Board                     | Tennessee River         | 23329      |
| Watts Bar Lake/Ft Loudoun Lake (06010201) | Loudon | Loudon Utilities Board                        | Tennessee River         | 12444      |
| Watts Bar Lake/Ft Loudoun Lake (06010201) | Blount | Maryville Department of Water Quality Control | Little River            | 48120      |
| Watts Bar Lake/Ft Loudoun Lake (06010201) | Rhea   | Newport Resort Water System                   | Well                    | 155        |
| Watts Bar Lake/Ft Loudoun Lake (06010201) | Roane  | Rockwood Water System                         | Watts Bar Lake          | 11045      |

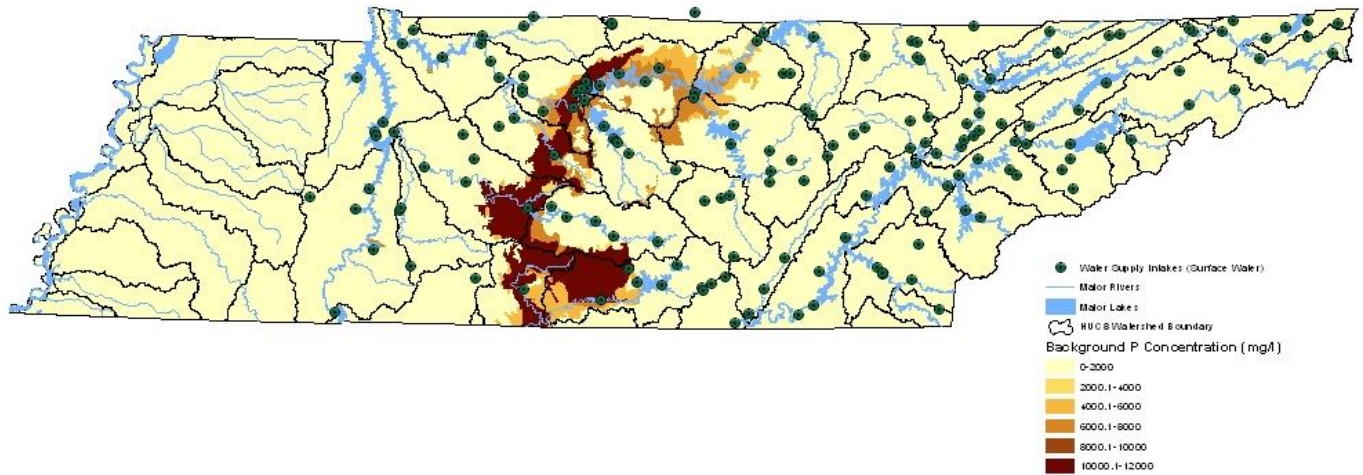
**Table A-1s Water Systems, Their Sources and Population Served**

| WATERSHED                                 | COUNTY   | SYSTEM                                  | SOURCE           | POP SERVED |
|---|----------|---|------------------|------------|
| Watts Bar Lake/Ft Loudoun Lake (06010201) | Rhea     | Spring City Water System                | Piney River      | 2678       |
| Watts Bar Lake/Ft Loudoun Lake (06010201) | Monroe   | Sweetwater Utility Board                | Sweetwater Creek | 12141      |
| Watts Bar Lake/Ft Loudoun Lake (06010201) | Monroe   | Sweetwater Utility Board                | Spring           |            |
| Watts Bar Lake/Ft Loudoun Lake (06010201) | Rhea     | Watts Bar Utility District              | Wells            | 12549      |
| Watts Bar Lake/Ft Loudoun Lake (06010201) | Rhea     | Yost Trailer Park                       | Wells            | 9          |
| Watts Bar Lake/Ft Loudoun Lake (06010201) | Loudon   | Loudon Utilities Board                  | Spring           | 12444      |
| Wheeler Lake (06030002)                   | Giles    | Ardmore Water System                    | Wells            | 1649       |
| Wheeler Lake (06030002)                   | Lincoln  | Lincoln Co Board of Public Utilities #1 | Wellfields       | 20450      |
| Wolf River (08010210)                     | Shelby   | Bartlett Water System                   | Wellfields       | 58477      |
| Wolf River (08010210)                     | Shelby   | Collierville Water Dept                 | Wellfields       | 44196      |
| Wolf River (08010210)                     | Shelby   | Germantown Water Dept-East              | Wells            | 37271      |
| Wolf River (08010210)                     | Hardeman | Grand Junction Water Dept               | Well             | 1171       |
| Wolf River (08010210)                     | Fayette  | La Grange Water Dept                    | Wells            | 227        |
| Wolf River (08010210)                     | Fayette  | Moscow Water Dept                       | Well             | 808        |
| Wolf River (08010210)                     | Fayette  | Rossville Water System                  | Well             | 1081       |
| Wolf River (08010210)                     | Shelby   | Memphis Light Gas & Water               | Wells            | 671721     |

**Table A-1t Water Systems, Their Sources and Population Served**

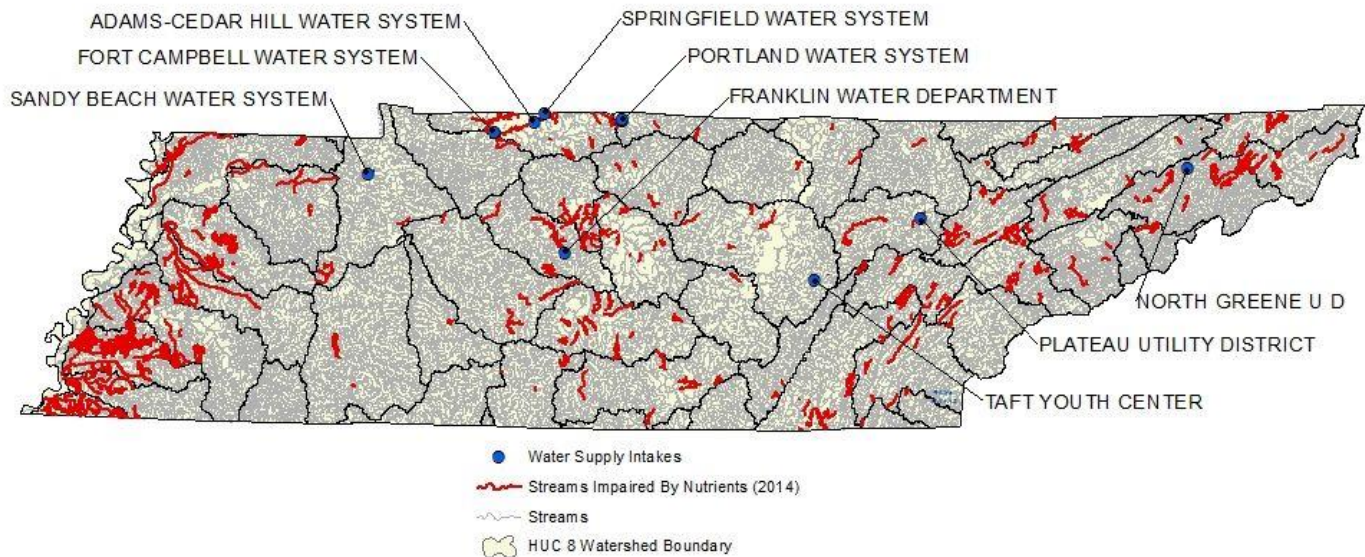
## APPENDIX B – WATER SYSTEMS & THEIR THREATS

### BACKGROUND PHOSPHORUS AND WATER SUPPLY INTAKES



**Figure B- 1 Water Supply Intakes & Background Phosphorus Concentrations -** Background phosphorus data are from United States Geological Survey and represents bed sediment sample concentrations as described in Scientific Investigations Map 3102 (published 2010).

## WATER SUPPLY INTAKES LOCATED ON NUTRIENT IMPAIRED SURFACE WATERS

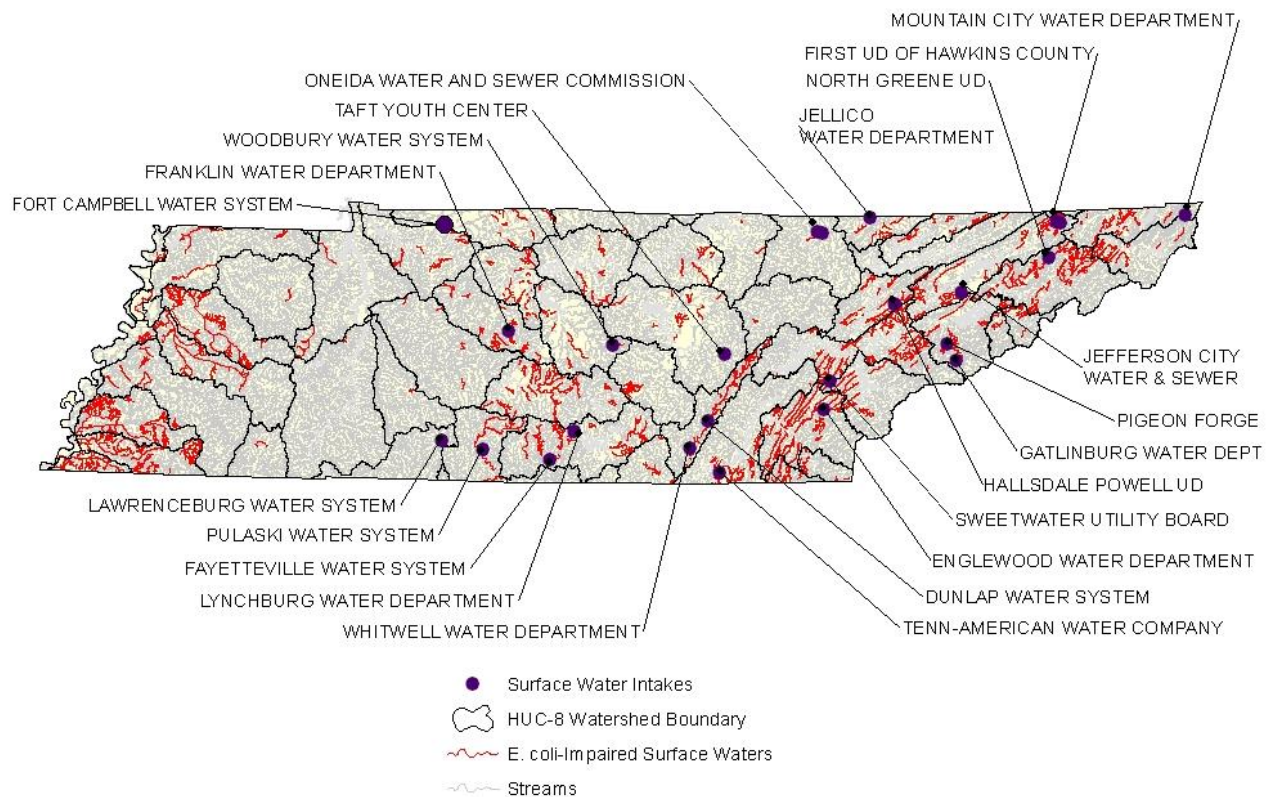


**Figure B- 2 Water Supply Intakes Located on Nutrient-Impaired Surface Waters -** *Causes of nutrient impairments are nitrates, nitrites, phosphates, phosphorus (total) or nutrient/eutrophication and are based on the 2014 draft 303(d) List. UD, Utility District.*

| CITY          | PUBLIC WATER SUPPLY           | SOURCE             |
|---------------|-------------------------------|--------------------|
| Adams         | Adams-Cedar Hill Water System | Red River          |
| Franklin      | Franklin Water Department     | Harpeth River      |
| Fort Campbell | Fort Campbell Water System    | Red River          |
| Greeneville   | North Greene Utility District | Lick Creek         |
| Pikeville     | Taft Youth Center             | Bee Creek          |
| Portland      | Portland Water System         | City Lake          |
| Portland      | Portland Water System         | Sportsman Lake     |
| Springfield   | Springfield Water System      | Red River          |
| Springville   | Sandy Beach Water System      | Kentucky Lake      |
| Wartburg      | Plateau Utility District      | Crooked Fork Creek |

**Table B- 1 Water Supply Intakes Located on Nutrient-Impaired Surface Waters.** *Causes of nutrient impairments are nitrates, nitrites, phosphates, phosphorus (total) or nutrient/eutrophication and are based on the 2014 303(d) List.*

## WATER SUPPLY INTAKES LOCATED ON PATHOGEN-IMPAIRED SURFACE WATERS

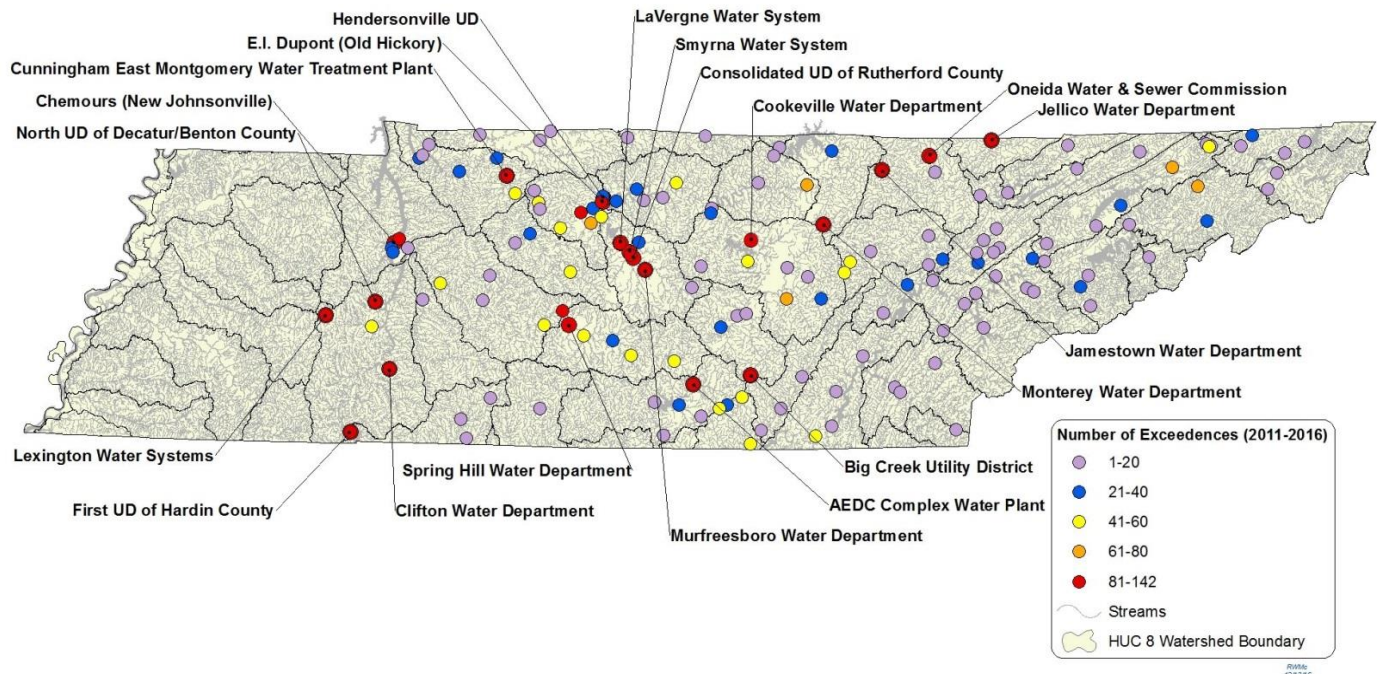


**Figure B- 3 Water Supply Intakes Located on Pathogen-Impaired Surface Waters-**  
*Cause of pathogen impairment is E. coli and is based on the draft 2014 303(d) List.*



| CITY           | PUBLIC WATER SUPPLY          | SOURCE                 |
|----------------|------------------------------|------------------------|
| Chattanooga    | Tenn-American Water Co.      | Tenn River             |
| Church Hill    | First U D Of Hawkins Co, #1  | Alexander Creek        |
| Church Hill    | First U D Of Hawkins Co, #1  | Hord Creek             |
| Dunlap         | Dunlap Water System          | Sequatchie River       |
| Englewood      | Englewood Water Dept         | Middle Creek           |
| Fayetteville   | Fayetteville Water System    | Elk River              |
| Ft Campbell    | Fort Campbell Water System   | Red River              |
| Franklin       | Franklin Water Department    | Harpeth River          |
| Gatlinburg     | Gatlinburg Water Dept        | Little Pigeon River    |
| Greeneville    | North Greene U D             | Lick Creek             |
| Jefferson City | Jefferson City Water & Sewer | Mossy Creek            |
| Jellicio       | Jellico Water Dept           | Elk Fork Creek         |
| Knoxville      | Hallsdale Powell U D         | Beaver Creek           |
| Lawrenceburg   | Lawrenceburg Water System    | Shoal Creek            |
| Lynchburg      | Lynchburg Water Department   | Mulberry Creek         |
| Mountain City  | Mountain City Water Dept     | Laurel Creek           |
| Oneida         | Oneida W&S Comm              | Howard Baker Lake      |
| Oneida         | Oneida W&S Comm              | City Lake              |
| Pigeon Forge   | Pigeon Forge                 | Walden's Creek         |
| Pikeville      | Taft Youth Center            | Bee Creek              |
| Pulaski        | Pulaski Water System         | Richland Creek         |
| Sweetwater     | Sweetwater Utility Board     | Sweetwater Creek       |
| Whitwell       | Whitwell Water Dept          | Sequatchie River       |
| Woodbury       | Woodbury Water System        | East Fork Stones River |

**Table B- 2 Water Supply Intakes Located on Pathogen-Impaired Surface Waters.** *Cause of pathogen impairment is E. coli and is based on the 2014 303(d) List.*



**Figure B- 4 Water Supply Intakes Where Total Organic Carbon Exceeds 2 Parts Per Million.** *Time period for data is November 1, 2011 through October 31, 2016.*

| PUBLIC WATER SYSTEM                 | SOURCE                   | NUMBER OF TOC EXCEEDENCES |
|-------------------------------------|--------------------------|---------------------------|
| Adams-Cedar Hill Water System       | Red River                | 9                         |
| AEDC Complex-Water Plant            | Woods Reservoir          | 101                       |
| Alcoa Water System                  | Little River             | 4                         |
| Arthur-Shawnee Utility District     | Powell River             | 18                        |
| Ashland City Water Department       | Big Marrowbone           | 48                        |
| BCCX Water System                   | Bee Creek Impoundment    | 27                        |
| Bedford County UD                   | Duck River               | 39                        |
| Big Creek Utility District          | Ranger Creek Impoundment | 120                       |
| Bloomington Utility District        | Reedy Creek              | 36                        |
| Bon Aqua-Lyles Utility District     | Piney River              | 3                         |
| Bon De Croft Utility District       | Billy's Branch           | 4                         |
| Bristol Department of Utilities     | South Fork Holston River | 7                         |
| Bristol-Bluff City Utility District | South Fork Holston River | 18                        |
| Byrdstown Water Department          | Dale Hollow Lake         | 29                        |
| Camden Water Department             | Tennessee River          | 26                        |
| Carthage Water System               | Cumberland River         | 15                        |
| Celina Water System                 | Obey River               | 9                         |

**Table B- 3 Communities with Water Supply Intakes Exceeding 2 Parts Per Million Total Organic Carbon.**

| PUBLIC WATER SYSTEM                   | SOURCE                          | NUMBER OF TOC EXCEEDENCES |
|---------------------------------------|---------------------------------|---------------------------|
| Chemours-New Johnsonville             | Tennessee River                 | 101                       |
| Claiborne County Utilities District   | Clinch River                    | 11                        |
| Clarksville Water Department          | Cumberland River                | 35                        |
| Clifton Water Department              | Tennessee River                 | 96                        |
| Columbia Power and Water Sys          | Duck River                      | 44                        |
| Consolidated UD of Rutherford Co      | E Fork Stones River             | 106                       |
| Cookeville Water Department           | Center Hill Lake                | 85                        |
| Crab Orchard Utility District         | Otter Creek Impoundment         | 14                        |
| Crossville Water Department           | Holiday Hills Lake              | 46                        |
| Crossville Water Department           | Meadow Park Lake                | 47                        |
| Cumberland Utility District           | Little Emory River              | 32                        |
| Cunningham East Montgomery UD         | Cumberland River                | 115                       |
| Dayton Water Department               | Tennessee River                 | 5                         |
| Dover Water Department                | Cumberland River                | 36                        |
| Duck River Utility Commission         | Normandy Lake                   | 55                        |
| E.I. Dupont, Old Hickory              | Old Hickory Lake                | 121                       |
| Eastside Utility District             | Volunteer Army Ammunition Plant | 11                        |
| Englewood Water Department            | Middle Creek                    | 8                         |
| Erin Water Treatment Plant            | Cumberland River                | 30                        |
| Fayetteville Public Utilities         | Elk River                       | 19                        |
| First Utility District of Hardin Co   | Tennessee River                 | 103                       |
| First Utility District of Hawkins Co  | Alexander Creek                 | 7                         |
| First Utility District of Hawkins Co  | Hord Creek                      | 10                        |
| First Utility District of Hawkins Co  | Holston River                   | 46                        |
| First Utility District of Knox County | Sinking Creek                   | 17                        |
| Franklin Water Department             | Harpeth River                   | 53                        |
| Gainesboro Water System               | Cumberland River                | 7                         |
| Gallatin Water Department             | Cumberland River                | 26                        |
| Gladeville Utility District           | Wells                           | 27                        |
| Greeneville Water / Light             | Nolichucky River                | 34                        |
| Hallsdale Powell UD                   | Melton Hill Reservoir           | 20                        |
| Harpeth Valley UD Plant A             | Cumberland River                | 45                        |
| Harriman Utility Board                | Emory River                     | 19                        |
| Hartsville/Trousdale UD               | Cumberland River                | 60                        |

**Table B-3a Communities with Water Supply Intakes Exceeding 2 Parts Per Million Total Organic Carbon.**



| PUBLIC WATER SYSTEM               | SOURCE                    | NUMBER OF TOC EXCEEDENCES |
|-----------------------------------|---------------------------|---------------------------|
| Hendersonville Utility District   | Old Hickory Lake          | 104                       |
| Huntsville Utility District       | New River                 | 3                         |
| Jamestown Water Department        | North White Oak Creek     | 109                       |
| Jasper Water Department           | Sequatchie River          | 19                        |
| Jellico Water Department          | Mine Impoundment          | 100                       |
| Jonesboro Water Department        | Nolichucky River          | 7                         |
| Kingsport Water Department        | South Holston River       | 6                         |
| Kingston Water System             | Watts Bar Lake            | 17                        |
| Knox-Chapman Utility District-New | French Broad River        | 39                        |
| Knox-Chapman Utility District     | French Broad River        | 5                         |
| Knoxville UD #1 Whitaker Plant    | Tennessee River           | 28                        |
| La Vergne Water System            | Percy Priest Lake         | 126                       |
| Laguardo Utility District         |                           | 16                        |
| Lawrenceburg Water System         | Pickwick Lake             | 12                        |
| Lebanon Water System              | Cumberland River          | 19                        |
| Lenoir City Utility Board         | Tennessee River           | 20                        |
| Lewisburg Water System            | Duck River                | 42                        |
| Lexington Water Works             | Beech Lake                | 141                       |
| Livingston Water Department       | Roaring River             | 68                        |
| Loudon Utilities Board            | Tennessee River           | 6                         |
| Madison Suburban Utility District | Cumberland River          | 39                        |
| McMinnville Water Department      | Barren Fork River         | 10                        |
| Metro Lynchburg-Moore Co UD       | Tims Ford Reservoir       | 16                        |
| Monteagle Public Utility Board    | Laurel Lake               | 39                        |
| Monterey Water Department         | City Lake                 | 112                       |
| Morristown Water System           | Holston River             | 37                        |
| Murfreesboro Water Department     | East Fork Stones River    | 114                       |
| Nashville Water Dept-Harrington   | Cumberland River Plant #1 | 61                        |
| Nashville Water Dept-Omohundro    | Cumberland River Plant #2 | 54                        |
| New Johnsonville Water Dept       | Kentucky Lake             | 34                        |
| Newport Utilities Board           | French Broad River        | 14                        |
| North UD Decatur/Benton County    | Tennessee River           | 106                       |
| North Greene Utilities, Inc.      | Lick Creek                | 77                        |
| North Stewart Utility District    | Spring Lake               | 7                         |
| North Stewart UD-New Plant        | Spring Lake               | 20                        |
| Northeast Knox Utility District   | Holston River             | 17                        |

**Table B-3b Communities with Water Supply Intakes Exceeding 2 Parts Per Million Total Organic Carbon.**

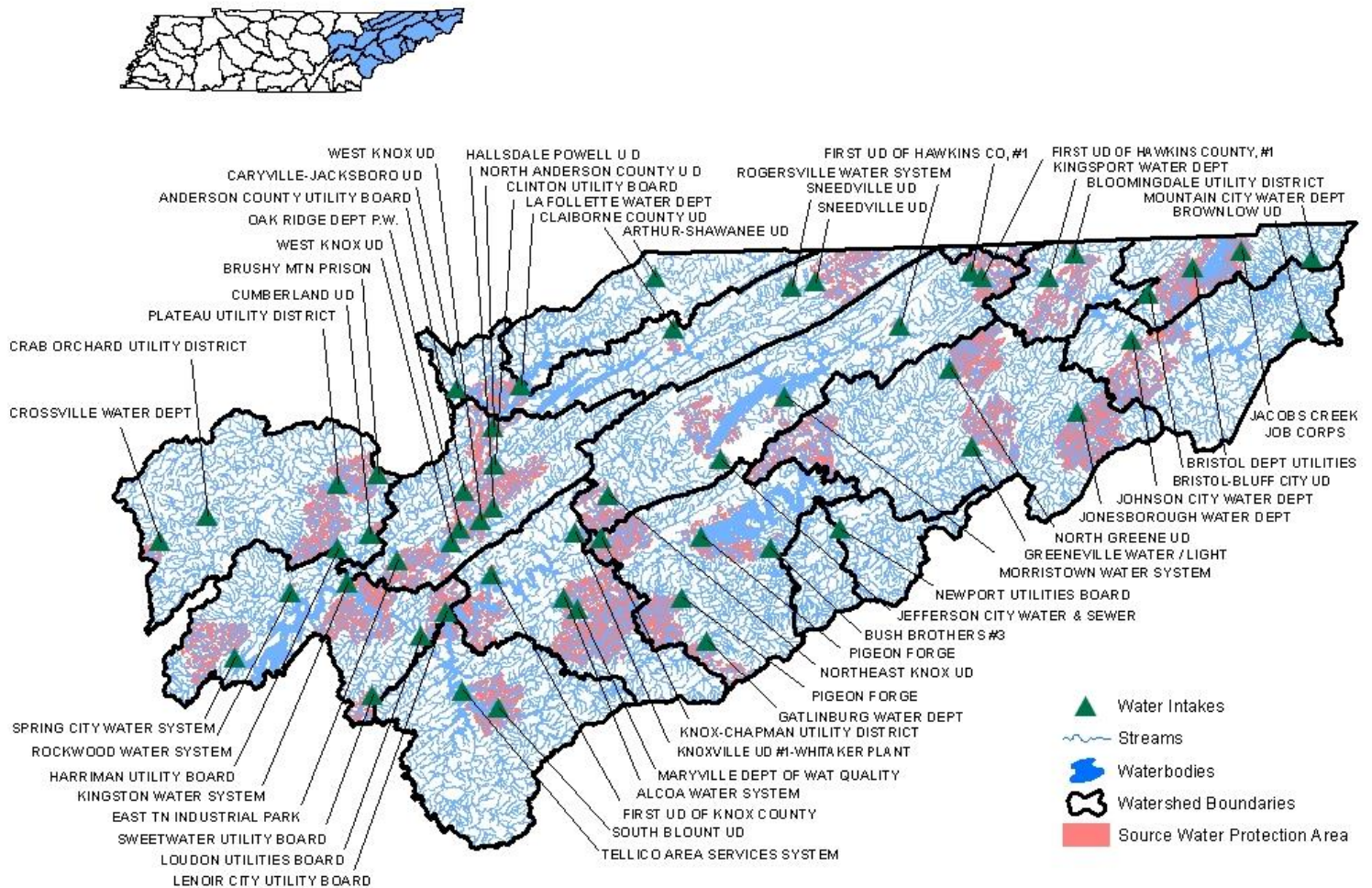
| PUBLIC WATER SYSTEM                  | SOURCE                  | NUMBER OF TOC EXCEEDENCES |
|--------------------------------------|-------------------------|---------------------------|
| Northwest Clay Co Utility District   | Cumberland River        | 15                        |
| Oak Ridge Dep Public Works           | Clinch River            | 9                         |
| Olin Corporation                     | Hiwassee River          | 7                         |
| Oneida Water and Sewer               | City Lake               | 142                       |
| Parsons Water Department             | Beech River             | 58                        |
| Pigeon Forge Water Department        | Walden's Creek          | 34                        |
| Plateau Utility District             | Crooked Fork Creek      | 7                         |
| Pleasant View Utility District       | Sycamore Creek          | 4                         |
| Portland Water System                | Sportsman Lake          | 10                        |
| Pulaski Water System                 | Richland Creek          | 9                         |
| Resolute Forest Products             | Hiwassee River          | 6                         |
| River Road Utility District          | Brush Creek             | 13                        |
| Rockwood Water System                | Watts Bar Lake          | 28                        |
| Rogersville Water System             | Big Creek               | 64                        |
| Second South Cheatham UD             | Harpeth River           | 24                        |
| Sewanee Utility District             | Lake O'Donnell          | 47                        |
| Shelbyville Water System             | Duck River              | 41                        |
| Smith Utility District               | Caney Fork River        | 34                        |
| Smithville Water System              | Center Hill Lake        | 59                        |
| Smyrna Water System                  | Stones River            | 120                       |
| Sneedville Utility District          | Clinch River            | 12                        |
| South Pittsburg Water System         | Tennessee River         | 47                        |
| Sparta Water System                  | Calfkiller River        | 5                         |
| Spencer Water System                 | City Impoundment        | 80                        |
| Spring City Water System             | Piney River             | 17                        |
| Spring Hill Water Department         | Duck River              | 90                        |
| Springfield Water System             | Red River               | 10                        |
| TN-American Water Company            | Tennessee River         | 54                        |
| TN-American Water Co-Sequatchie      | Tennessee River         | 5                         |
| Tracy City Water System              | Big Fiery Gizzard Creek | 44                        |
| Turney Center                        | Duck River              | 55                        |
| Warren County Utility District       | Collins River           | 3                         |
| Water Authority of Dickson Co        | Cumberland River        | 42                        |
| Waverly Water System                 | Duck River              | 8                         |
| West Knox Utility District-Old Plant | Melton Hill Lake, Old   | 36                        |
| West Knox UD-New Plant               | Melton Hill Lake, New   | 12                        |
| West Warren-Viola Utility District   | Barren Fork River       | 29                        |

**Table B-3c Communities with Water Supply Intakes Exceeding 2 Parts Per Million Total Organic Carbon.**

| PUBLIC WATER SYSTEM          | SOURCE                  | NUMBER OF TOC EXCEEDENCES |
|------------------------------|-------------------------|---------------------------|
| West Wilson Utility District | Old Hickory Lake        | 32                        |
| White House Utility District | Old Hickory Lake        | 38                        |
| Winchester Water System      | Tims Ford Lake          | 36                        |
| Witt Utility District        | Nolichucky River/Spring | 8                         |

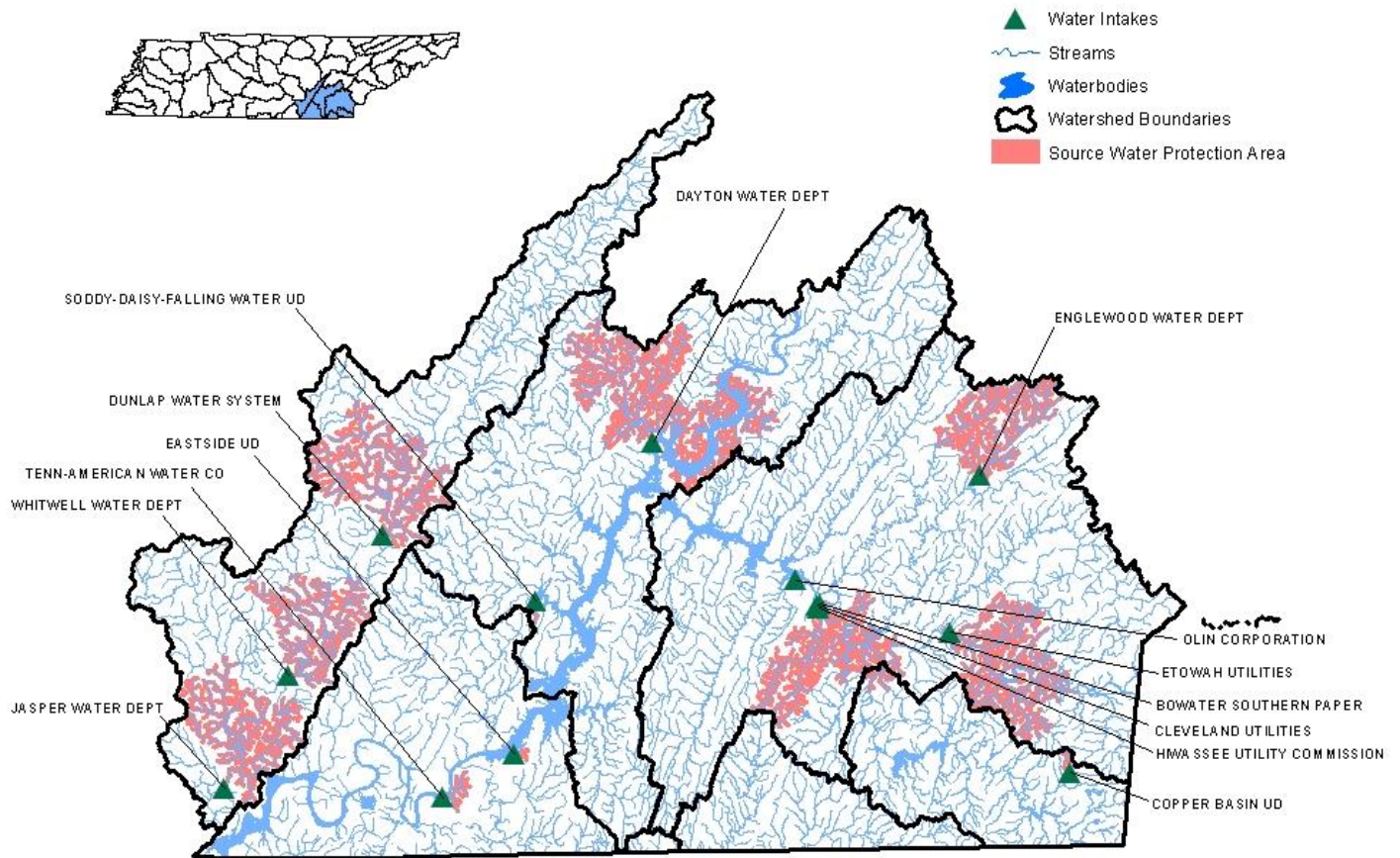
**Table B-3d Communities with Water Supply Intakes Exceeding 2 Parts Per Million Total Organic Carbon.**

## APPENDIX C – SOURCE WATER PROTECTION AREAS

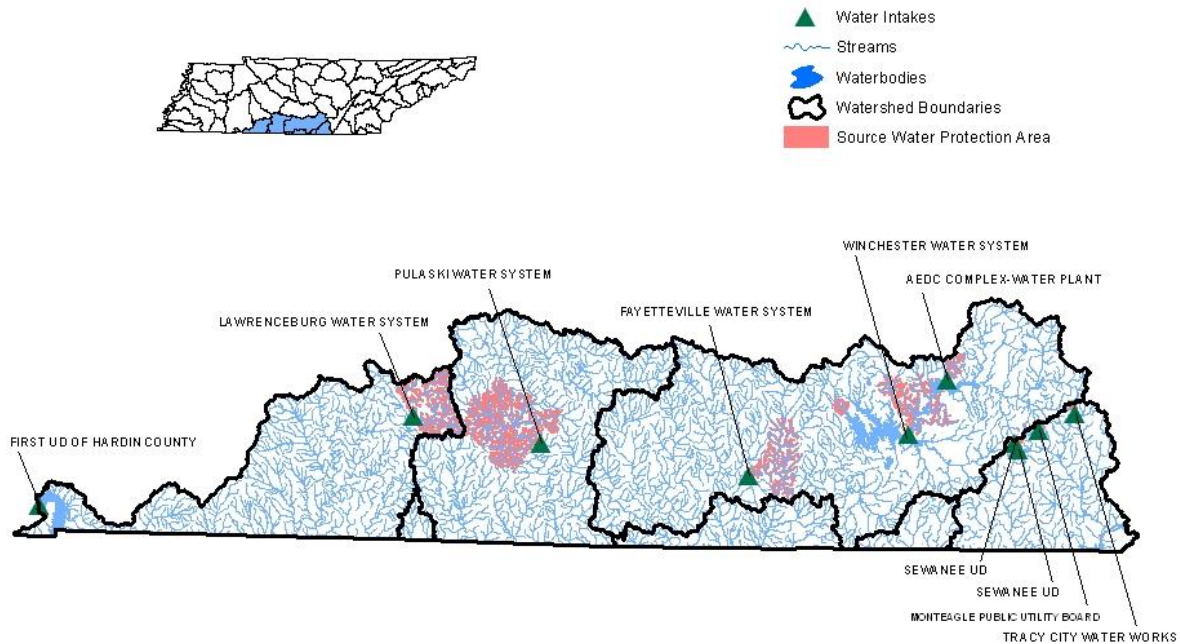


**Figure C- 1 Source Water Protection Areas in Upper Tennessee River Watersheds – (watershed HUCs beginning with 0601) TDEC continues to delineate additional Source Water Protection Areas in Tennessee as required by the Safe Drinking Water Act of 1996.**

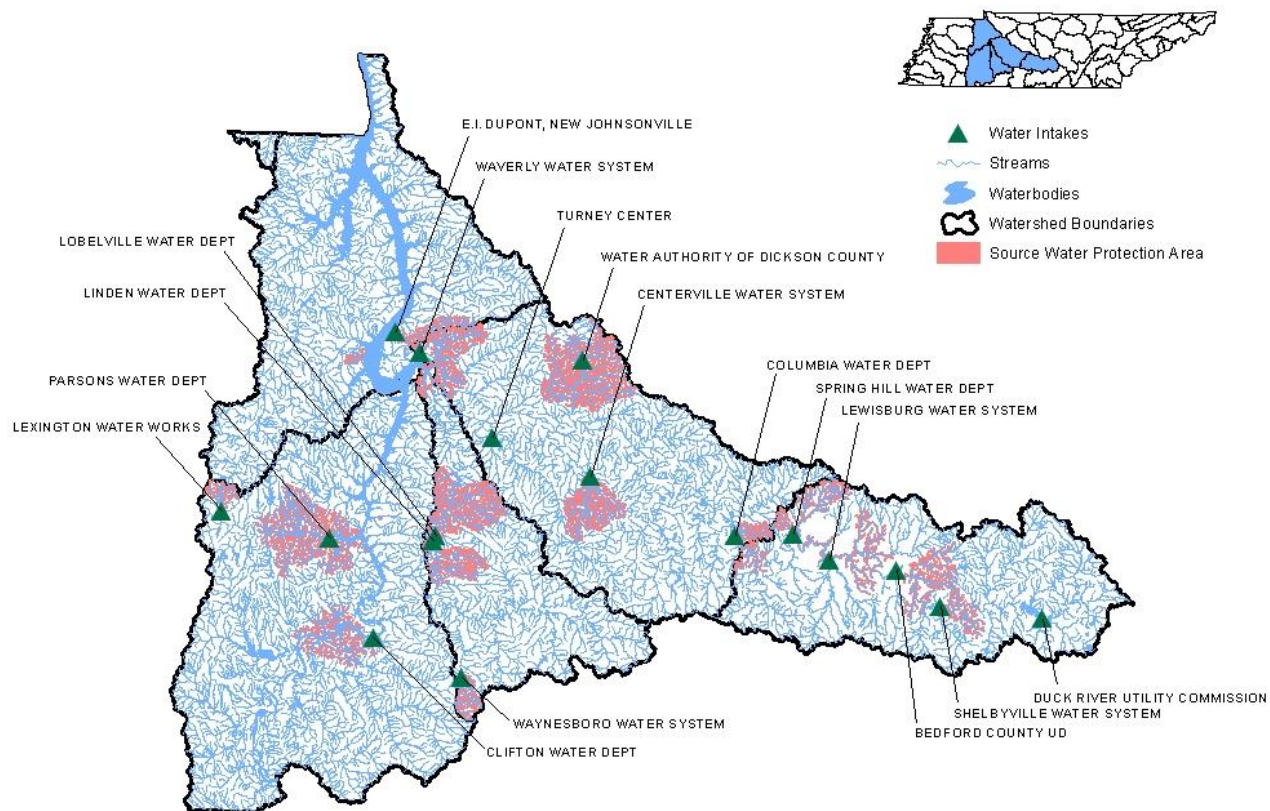




**Figure C- 2 Source Water Protection Areas in Tennessee River Watersheds – (watershed HUCs beginning with 0602)** TDEC continues to delineate additional Source Water Protection Areas in Tennessee as required by the Safe Drinking Water Act of 1996.

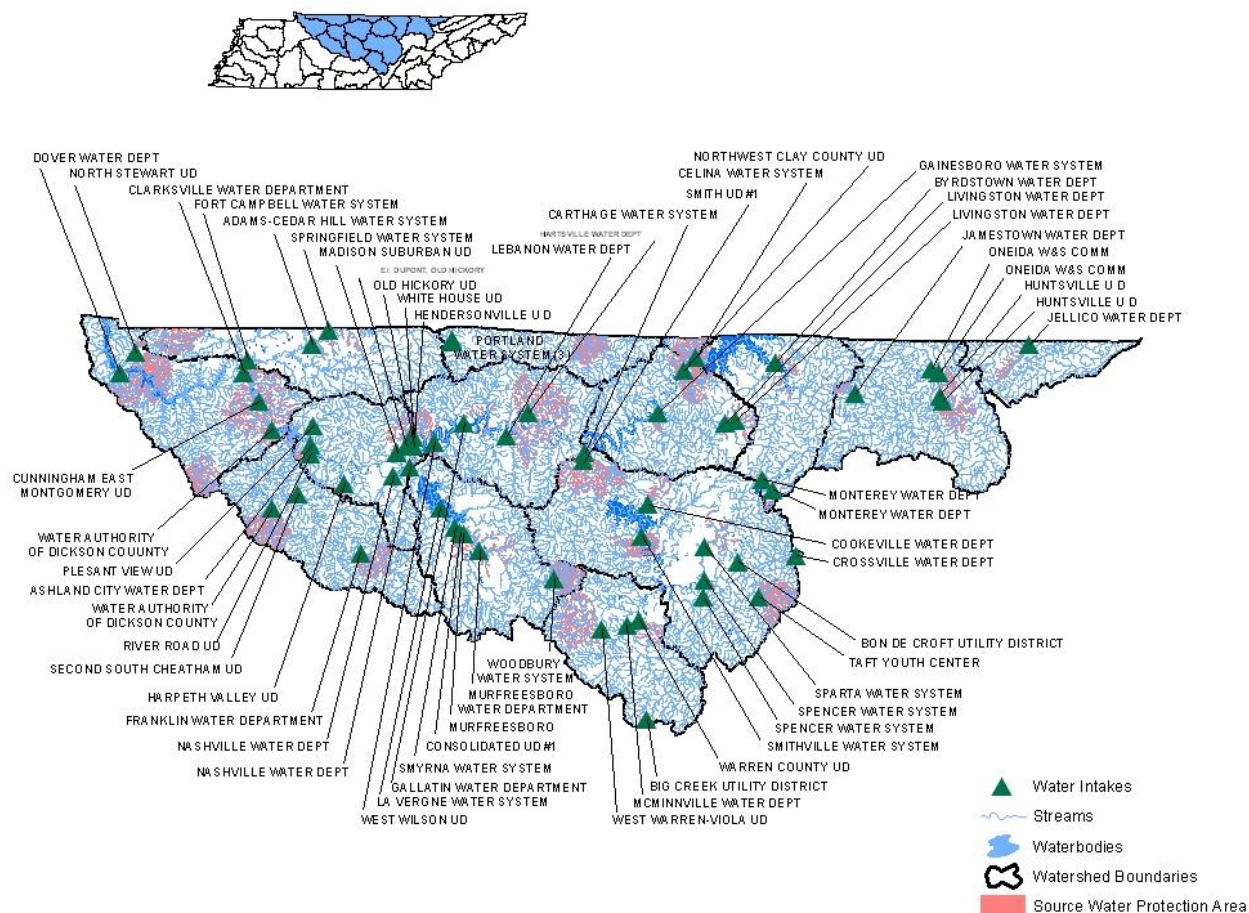


**Figure C- 3 Source Water Protection Areas in Middle Tennessee River Watersheds –** *(watershed HUCs beginning with 0603) TDEC continues to delineate additional Source Water Protection Areas in Tennessee as required by the Safe Drinking Water Act of 1996.*



**Figure C- 4 Source Water Protection Areas in Lower Tennessee River Watersheds –** *(watershed HUCs beginning with 0604) TDEC continues to delineate additional Source Water Protection Areas in Tennessee as required by the Safe Drinking Water Act of 1996.*





**Figure C- 5 Source Water Protection Areas in Cumberland River and Barren River Watersheds** – (watershed HUCs beginning with 0511 & 0513) TDEC continues to delineate additional Source Water Protection Areas in Tennessee as required by the Safe Drinking Water Act of 1996.